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THE CIRCULATION IN RELATION TO SHOCK*

BY

R. J. S. McDOWALL, M.D., D.Sc., F.R.C.P.Ed.

Professor of Physiology, University of London, King's College

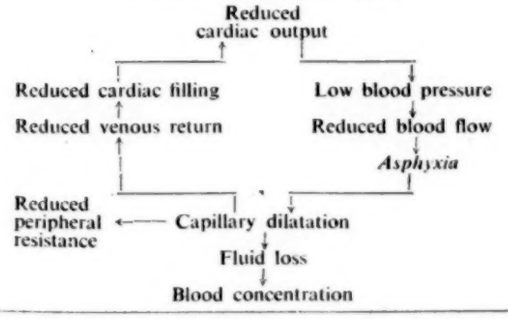
Surgeons have long been familiar with the term "surgical pathology," but it is now apparent that surgery needs physiology to such an extent that the term "surgical physiology" is necessary. Anatomy and pathology are essential for the practising surgeon, but surgery has another side upon which its further progress must depend, and I feel sure that the day is not far distant when practical physiology will be shown to be the best training-ground for the young surgeon who seeks to advance in his subject.

In no field is the common ground between surgery and physiology seen better than in relation to shock. The surgeon sees it carry off a large proportion of his patients after operation (Mummery put it at 21 per cent.), but I do not think it is realized that an even larger percentage of experimental animals die from the same cause. I do not propose to give a textbook lecture on shock: I leave that to the writers of surgical textbooks, because it seems to me that the physiologist can be of most use in indicating the essential nature of the problem and the lines along which we need new knowledge.

Established Shock

Differences of opinion exist as to the nature of shock, and it is therefore probably best to begin with the phenomenon of established shock just before death, regarding which there is no argument. There is a low blood pressure, a rapid heart, a thready pulse, a concentrated blood, and a low temperature because the metabolic rate has fallen. Such arteries as can be studied are constricted; so are the uninjured vessels of the skin. The patient is apathetic and does not seem to feel pain; he is obviously going to die. All are agreed that at this stage a vicious cycle (shown below) is in operation which inevitably leads to death.

TABLE I.—*The Death Cycle*



It is easy to understand the mechanism of this death cycle, which is common to many fatal illnesses. Suppose we begin with the low blood pressure. This leads to a bad blood supply and to asphyxia of the tissues. Asphyxial products bring about a dilatation of capillaries, which open up like a great sponge at the periphery and soak up the blood in the body. In addition the capillaries become abnormally permeable and the blood plasma filters into the tissues. This causes concentration of the blood and still further contributes to the problem of the "lost blood." With the fall of arterial pressure there is less of reflex activity of the spinal cord; the muscles go limp and cease to support the capillaries, and this facilitates their dilatation. This point was first noted by Starling and has been more recently referred to by Yandell Henderson.

The capacity of the vessels is now too large for the blood. Less blood is returned to the heart, the cardiac output is reduced and the fall of arterial pressure accentuated, and so the fatal process goes on. All authorities agree that the heart itself is not the cause of the shock in cases of injury, and in animals it may be demonstrated that just before death it is beating vigorously but is incompletely filled. Death is due to asphyxia.

The pathological appearance varies very much according to the means by which the shock is produced, but often very little is seen. In the more typically traumatic shock the organs are pale, but, according to Moon, congestion of the lungs and liver and ecchymosis are more typical, especially of toxic shock. We need very badly a systematic study of the pathological states found related to the methods of the production of shock. I believe, however, that it is extremely difficult to obtain reliable observations from human material because of delay in securing authority for post-mortem examinations and movement of blood after death (Shaw Dunn).

Peripheral Resistance

I have referred to the problem of the "lost blood," but I should not like to leave the impression that this is the sole problem; it is only half. If it were the only problem we could simply replace the blood, and we all know that results from transfusion of blood or saline are indeed disappointing. A commonly overlooked difficulty is that the peripheral resistance of the circulation is reduced and it is no longer possible to raise the arterial pressure without raising the venous pressure enormously and the capillary pressure and thus increasing capillary filtration tremendously. Probably the liver and the heart are damaged also. This is why transfusion is of the greatest value in haemorrhage but of so little

* Summary of an inaugural lecture on surgical physiology delivered at the Royal College of Surgeons of England on May 2, 1940.

use in established shock. In haemorrhage an intense constriction of the peripheral vessels occurs. There is in existence a Medical Research Council report of the last war by McNee, Sladden, and McCartney which states that, while cases of haemorrhage did well, in all cases of shock the patient died when transfused. On going into the literature I found that Wiggers, in America, had described the fall of peripheral resistance in shock in 1918. He arrived at this conclusion from a detailed study of the shape of the pulse wave, but at that time his work had not received the recognition which it now has. The fall can, however, be demonstrated by easier methods. A similar fall of peripheral resistance is produced by histamine (Dale and Richards; Hemingway and McDowall).

Unfortunately we do not know of any satisfactory method of raising the peripheral resistance. We know of no drug which will constrict the vessels of the body generally without acting deleteriously on the heart. All drugs which in moderate doses constrict the vessels of the muscles constrict also the coronary arteries. We are in urgent need of more knowledge regarding the pharmacology of the vessels of the muscles. And now we come to the possible factors in shock which may initiate the vicious circle. I would emphasize, however, that, while each may separately produce shock, several factors may in some cases act together.

Table II gives the possible causes of shock in probable order of importance.

TABLE II.—*Possible Causes of Shock*

1. Haemorrhage (obvious / concealed) ..	Capillary dilatation (oedema)
2. Toxins (local .. .. .. / general .. .. ..)	„ „ local / „ „ general
3. Excessive vasoconstriction ..	Asphyxia—→Capillary dilatation. Muscle dilatation ?
4. Reflex vasodilatation	All vessels except skin
5. Post-excitement, etc., depression	„ „ „
6. Central exhaustion and injury. CO_2 loss	„ „ „

1. Haemorrhage

Obvious Haemorrhage.—It is apparent that in injury a possible cause of shock is severe haemorrhage, but it is quite remarkable how much blood may be lost and yet the patient survive. I need not go into the various ways by which the body compensates for the loss of blood. Suffice it to say that there is generalized vasoconstriction until asphyxia supervenes. If given in time, transfusion or salines facilitate an almost certain recovery.

Concealed Haemorrhage and Local Oedema.—There is a large amount of experimental evidence, especially that by Blalock, that when a limb or the intestine is damaged material haemorrhage and loss of blood plasma occur in the region of the injury. It is well known that if a tourniquet is placed on a limb before or immediately after an injury shock does not arise, but it appears immediately the tourniquet is removed. This had been interpreted by Cannon and Bayliss as indicating that a toxin is washed into the circulation when the tourniquet is released. On going into the matter in more detail Blalock concluded that the animal bleeds into the injured part. He found that the artery is more important than the vein and that shock does not occur if the artery is clipped and the vein left free. In part there is also what is commonly known as "reactive hyperaemia." This conclusion has been supported by comparing the weight of the injured with a corresponding uninjured part of the body. The gain in weight has been found to correspond to a loss of blood which, it is claimed, is sufficient to cause shock. Moon, however, has attacked this thesis on the ground that it is not possible to get proper controls, for the shock reduces the amount of blood in the uninjured part, and this exaggerates the apparent gain in weight of the injured part. Blalock's results have received considerable support from Holt and Macdonald and by Charnley in Manchester, and from Bell, Clark, and Cuthbertson in Glasgow. All these observers ignore the effect of a reduced peripheral resistance in the injured part, but had they done so their evidence in favour of local dilatation would be still more striking. This may be considered against the criticism of Moon. I would like to emphasize that in all such experiments there is gross damage to relatively large amounts of tissues. The pathological picture is that of haemorrhage: the internal organs are pale from deprivation of blood.

2. Toxic Shock

By this is meant shock produced by the direct action of toxic substances of different kinds on the capillaries and the setting up of the vicious circle by increasing the capacity of the circulation while at the same time there is loss of fluid from the capillaries. The evidence collected in the last war appeared to show very conclusively that this was a common variety of shock. This view was supported by practically all the official reports, and the observations on which it depends are well put forward in the writings of Bayliss, of Cannon, and, more recently, of Moon.

Previous to 1925 or so there was a general impression that the toxic substance concerned was probably histamine, because it had been shown by Dale and Laidlaw that this substance would produce shock if injected into anaesthetized cats and dogs in minute quantities. The resulting shock was in practically all respects identical with that found clinically. More recent evidence, however, has shown most conclusively that histamine is not the substance concerned, and with this conclusion Dale now agrees. Histamine can be estimated in the blood, and it cannot be found that it is increased, while it has been shown that anaesthetized man and unanaesthetized cats can cope with quite large quantities without shock being produced. It has been found, too, that, except in the skin, histamine is present in very minute amounts in the tissues of the body.

The fact that histamine may now be freed from blame does not mean, however, that shock may not be produced by toxic substances acting as histamine would act, for there are many things which can only be explained in this way. Moon, the latest active supporter of this view, considers that much the most important fact is the finding of an increased concentration of the blood in cases of shock before the blood pressure has actually fallen—indeed, when it may have risen. This early rise of blood pressure will be discussed later. The observation that the blood may concentrate is not new. It was first made by Sherrington and Copeman in 1893, and has since been confirmed by a large number of observers, both experimentally and clinically. (Actually Sherrington and Copeman measured the specific gravity of the blood, but the blood count appears to be even more delicate.) A similar concentration of the blood is found in experimental shock (Dale and Laidlaw) produced by histamine. We have, however, yet to be certain that this increased concentration of the blood necessarily indicates toxic shock, for blood concentration occurs in shock produced in other ways. The toxic form of shock certainly occurs when minced muscle is put into the peritoneum, and in strangulated

Richter's hernia and septic conditions generally. Admittedly other factors may also assist in these states. On the other hand, we remember that individuals can survive from infarction of very large parts of organs free from organisms. It is a little difficult to see, however, why shock does not occur in infarction and absorption of blood clot. We urgently need an investigation into the exact nature of the toxic substances concerned. If this could be found, means for counteraction might be devised.

One important criticism is that it is not possible to demonstrate by cross-circulation or other methods that the blood of an animal suffering from traumatic shock is toxic. We must, however, remember that it is possible that the structures acted upon take up a certain amount of the toxic substance and that the effect is cumulative. Unfortunately cross-circulations are necessarily of short duration, and it is doubtful also if in such acute experiments the damaged tissue has had enough time to produce toxic bodies.

I have already referred to the observation that removal of a tourniquet on an injured limb may lead to the onset of shock. This, as I have said, was originally a main plank of the toxic theory, but the shock is now interpreted as due to the injured part taking up blood.

LOCAL TOXAEMIA

Since it has not been possible to find a toxin circulating in the blood it is possible that it may act locally where it is produced, and this may be considered to account for the increased concentration of the blood if the area affected is large enough. According to Blalock, who has done work on experimental burning, the local accumulation of fluid is sufficient to account for the shock. The results appear to be subject to the same criticism as similar experiments in relation to concealed haemorrhage. It is difficult, too, to imagine why patients who suffer from a rapidly filling pleurisy with effusion or ascites do not also suffer from shock.

The Nervous System in Shock

In regard to the nervous system in shock there is a great deal of confusion, and with the nervous system we must couple the medulla of the adrenal glands, which secrete adrenaline. It is quite remarkable how differently modern workers have considered this matter. Some, like Blalock and Moon, almost ignore the nervous system as a factor; others, such as O'Shaughnessy and Slome, believe that the nervous system dominates the picture. It has long been recognized that during rest the blood-vessels are kept in a state of partial contraction by the action of a vasoconstrictor centre in the medulla acting through the sympathetic. If the centre is removed or the pathways from it are destroyed the vessels supplied dilate and there is a temporary fall of blood pressure, depending on the number of vessels affected. This is the basis of much surgical treatment for spasm. If the sympathetic is stimulated there is a constriction of vessels, especially of the skin and intestine, which is enhanced by the secretion of adrenaline. Now, the chief conditions which bring the sympathetic into operation are mental stress, fear, anger, pain, and cold. It is also extremely important in the normal reaction of the body to haemorrhage, and by its activity the blood pressure is maintained in spite of considerable loss of blood. It is not, however, so well known that adrenaline causes a dilatation of the vessels of the muscles. We have become obsessed by the classical picture of the rise of the blood pressure resulting from the injection of an enormous dose of adrenaline, a dose many times that ever secreted. It can easily be shown that minute doses of adrenaline, quite insufficient to raise the blood pressure, dilate the vessels of the muscle at the same time as they constrict the vessels of the skin. This is well seen if the changes in the volume of a skinned and unskinned limb be recorded (Fig. 1). The foregoing is only one of the

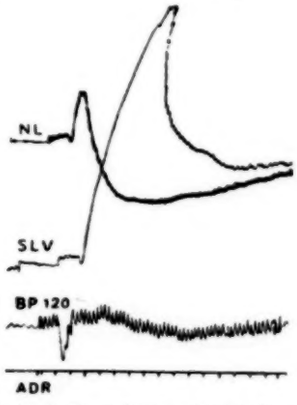


FIG. 1.—Record of the volume changes in a skinned limb, S.L.V., and of an intact limb, N.L., and of the blood pressure of a cat to which a minute dose of adrenaline has been administered intravenously. The skin constriction and the muscle dilatation are well seen, and cannot be attributed to the negligible changes in the blood pressure.

many examples of the fallacy of the blood-pressure records. But even more important is the fallacy in regard to haemorrhage or shock produced by toxins. The slightest fall of blood pressure must be considered as indicating that the compensating sympathetic activity is already in action.

In considering the role of the nervous system in shock there are several possibilities. The vasoconstrictor adrenaline system may be excessively stimulated, it may be inhibited and a depressed state may succeed stimulation; it may be exhausted or damaged. Experimentally all four states may be produced.

Hitherto the most important view of the neurogenic production of shock was that the vasoconstrictor centre was exhausted. This idea was originally put forward by Crile and was extensively supported by Lockhart-Mummery in a Hunterian Lecture. It has, however, been quite clearly shown that in the majority of cases the centre is not damaged or exhausted in shock, because it will react to suitable stimuli and often the arteries are constricted. It has been taken for granted, therefore, that the nervous factor was of little importance. With a fuller understanding of the control of the circulation it has become evident that shock may be produced in several other ways through the agency of the nervous system.

3. Excessive Sympathetic Stimulation

The possibility that the sympathetic adrenal system may be over-stimulated now receives most serious consideration, because we know that this is a normal compensating process in haemorrhage and in shock produced by toxic substances. It is a new idea that the compensation may be harmful or excessive. The possibility is based on the work of Freeman, who showed that if adrenaline is infused into an animal at the rate it is normally secreted the animal passes into a state of shock associated with a concentration of blood and low blood volume. Similar results have been obtained by Britton and Cannon in decorticated animals, which pass into shock after a short period of so-called "sham rage." Quite independently G. A. Clark of Sheffield has found

that the organs of animals so shocked present the congestion and ecchymosis which Moon has found typical also of toxic shock.

Freeman suggests that in the production of shock the sympathetic by its activity causes intense vasoconstriction, a peripheral asphyxia, and capillary dilatation, and thus sets up the vicious circle. Such an asphyxial dilatation I have produced in the ear of a rabbit by prolonged sympathetic stimulation. I am, however, inclined to think that the driving of the blood into the relaxed vessels of the muscles may be just as important and allow loss of the blood plasma, for shocked patients do not become blue, as might be expected in asphyxia. It is of special interest to remark that Freeman has found that the shock is prevented, and even that from haemorrhage reduced, by removal of the sympathetic or its paralysis by ergotoxine. In this connexion it is of some interest that Lockhart-Mummery recommended the use of ergot in 1905, before its effect in reversing the action of adrenaline was known, and it may be that keeping the patient warm also reduces sympathetic activity. He also recommended the use of adrenaline!

We must, then, ask ourselves, Is it possible that similar states occur clinically? Certain facts are very suggestive. We know, of course, that in injury and in operation there is a considerable element of fear and pain; we know that cold is detrimental to shocked cases. It has been stressed, in this country particularly by Zachary Cope, that the state of established shock is commonly preceded by a period during which the blood pressure is above normal, and Moon emphasizes that the blood concentration occurs before the blood pressure begins to fall. It is stated that painful superficial burns are much more likely to give shock than deep burns which damage nerves. It may be, of course, that the toxins from damaged skin are more poisonous than those from deeper structures.

It is important at this stage to realize that the acceptance of the significance of this factor of overaction of the sympathetic does not necessarily make it impossible to hold that there may not at the same time be concealed haemorrhage into muscle; indeed, it is quite possible that the excessive contraction of the vessels elsewhere will cause an exaggeration of the haemorrhage. Certainly in the case of muscle injury it must be admitted that if, for example, the skin vessels did not constrict and drive out their blood less haemorrhage would take place. At the same time most, I think, find it difficult to believe that Nature should provide a protective mechanism against haemorrhage which so easily does harm when its help is most needed.

The importance of this factor in shock lies in the possibility that the administration of adrenaline and similar substances—for example, ephedrine—may do harm, and in the possible desirability of reducing sympathetic activity by pharmacological agents. The effect of pituitary extract on blood distribution is similar to that of adrenaline.

4. Inhibition of the Vasomotor Mechanism

Experimentally a profound fall of blood pressure may be produced in animals by mechanical stimulation, but experimentalists know that for reasons not completely understood cats vary very much in this respect. It has been found that the animals are particularly sensitive to such stimuli in spring, when the sympathetic is most active. Also, the cats must be in a certain depth of anaesthesia, and the fall is apt to occur more readily under certain anaesthetics. The trauma necessary to produce shock is often quite small: sometimes merely repeatedly tapping the tibia or muscles is sufficient to cause shock.

Most observers use anaesthetics which unduly depress the reflexes and are therefore unable to produce this type of shock. These facts regarding anaesthetics have given critics of the neurogenic hypothesis of shock production a basis for their criticism, but I would emphasize that the same results can be obtained in decerebrate animals—the nearest imitation of the unanaesthetized patient we can obtain.

In Fig. 2 is shown the record of an animal under dial in which a fall of blood pressure was produced by driving a sharp object a few times through the muscles of the thigh. It is seen that the fall of blood pressure is

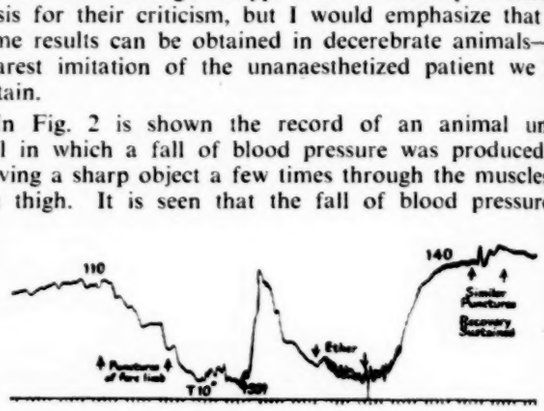


FIG. 2.—(For description, see text.)

profound and sustained. Faradic stimulation of the sciatic nerve caused a temporary recovery, but etherization of the animal resulted in complete recovery, during which puncturing of the muscle was without effect. Such a record shows most clearly that afferent impulses were responsible for the fall of arterial pressure and the state of the centre. I am not prepared to say whether the fall is due to a local or general dilatation of vessels; but such experiments, together with those of O'Shaughnessy and Slome and of Bell, Clark, and Cuthbertson, who found that shock from mechanical injury to a leg was much more difficult to obtain if the nervous pathways were blocked, again show beyond doubt the importance of the nervous system. It may be that a local vasodilator reflex like the nutrition reflex of Hess is concerned. Again we ask ourselves, Does this form of shock occur clinically? It seems most probable that it is this kind of shock which occasionally accompanies apparently trivial wounds or which may occur almost immediately after severe wounds or operations. It is stated also that shock is most likely to occur in patients who are ill and exhausted. John Hunter records two instances of men who died quite soon after having their testes bitten off by horses, and such cases of death from trivial injury are well recognized in medico-legal circles. A difficulty in the acceptance of this possibility may be the fact that we know that in shock the arteries are constricted and the skin pale, but we must remember that once the vicious circle is in operation an increased capacity effect due to capillary dilatation predominates and the vasoconstrictor centre may then compensate by causing constriction. We know that in ordinary fainting the vessels of the skin are constricted.

Whether or not central inhibition is important as a primary cause of shock requires further clinical study, but if it occurs at all it must contribute to failure of the circulation in haemorrhage and toxaemia by reducing the power of compensation.

Anaesthetics in Shock

We have, then, two clear possibilities in regard to shock produced by stimulation of afferent nerves. In one the sympathetic system may be stimulated and in the other it may be inhibited. We urgently want to know what is

happening in the sympathetic efferent nerves. According to Gaylor, there is in shock complete "silence" in sympathetic nerves, but so far it appears that only the accelerator nerves to the heart have been studied. Both types of case would obviously be benefited by anaesthesia, but, because of the well-known danger of giving anaesthetics in toxic shock, so far no one has dared to give anaesthetics as a routine to shocked cases unless it was really necessary, and then the blood pressure is not often taken. I do not think there can be any doubt that some kinds of shock are prevented by anaesthesia. This is certainly true of some varieties of experimental traumatic shock in animals, in which it has been shown that there is a great increase in the number of impulses passing up the afferent nerves from the shocked area (Beattie and Slome).

In these modern days we can scarcely contemplate operation without anaesthesia, but we have it on no less authority than that of Lister that the introduction of chloroform materially reduced post-operative shock. This is confirmed by a large number of surgeons. Some of these, like Cushing, follow Crile and prefer local blocking of nerves to general anaesthesia. This subject was referred to extensively by Lockhart-Mummery in his Hunterian Lecture. This blocking is considered to be specially important in weakly persons likely to go into shock. In experimental work there is much discrepancy on this point, largely because different workers have used different amounts of trauma and animals in different states of anaesthesia (cf. Holt and Macdonald; O'Shaughnessy and Slome).

Anaesthesia does not tell, however, if the shock is due to excessive stimulation or to inhibition of the sympathetic. But, what is still more difficult, are we justified in giving some form of anaesthetic to patients who are shocked? If morphine is beneficial would some other nervous depressant be even more valuable? These are all clinical problems that can only be solved by experiment. If the nervous factor is not a contributory factor then all anaesthetics, and even morphine, should be avoided where possible, because they reduce the normal compensatory mechanism to haemorrhage and capillary dilatation. Through the courtesy of Mr. Clark, at the Glasgow Royal Infirmary, I have tried to find out if the pulse rate in burns gives any clue regarding sympathetic activity, but so far I cannot discover anything definite. Some patients are recorded as being severely shocked with pulses of 130, which suggests increased sympathetic action, but others are also shocked with pulses of under 90. I have, however, found that practically all the patients who die are shocked from the moment they are admitted, and that death occurs on the first or the second day. I have since found that Mitchiner says that 80 per cent. die in the first two days and only 20 per cent. are septic. The type of patient suffering from burns who was admitted unshocked and died about the third or fourth day seems to have disappeared under modern treatment, although there are still a few, especially old people, who die from pulmonary complications at the end of a week. So far as burns are concerned I would agree with O'Shaughnessy that the old differentiation of primary and secondary shock is obsolete. Either the initial shock is fatal or it is evanescent.

I do not wish, however, to leave the subject of anaesthetics without again emphasizing the fact that the individual who gives an anaesthetic such as ether or chloroform in obviously toxic shock is guilty of little short of homicide. I believe Wilson has found that such anaesthetics are harmful in shock from burns.

5. Depression of the Sympathetic following Stimulation

Whenever the sympathetic is stimulated there follows a period when it is depressed or resting. This we see in the slowing of the heart and the fall of blood pressure which occur after sensory stimulation or exercise. Clinically the depression which follows intense excitement is well known. It is commonly called exhaustion; but, experimentally, during the depressed period it is quite possible to cause stimulation. It is not practicable to discuss here the possible cause of the depression (see McDowall, 1931). This type of shock may occur as a sequel to the overstimulation referred to under the heading "Excessive Sympathetic Stimulation."

On searching the older literature I found two very interesting examples of this depression given by John Hunter. He writes: "Lord Eglinton informed me that whenever two soldiers are condemned to be shot but one was to be pardoned and they were to throw dice for their lives, that commonly the successful one fainted while the other remained calm." He also records the case of a lady who awoke one night to find a man with a revolver entering her bedroom. She managed to get outside and lock the burglar in the bedroom, whereupon she immediately fainted.

Those of us who have had an operation can realize the intense relief there is at finding oneself alive and relatively free from pain when the event is over. I believe, too, that depression is quite common in airmen after a period of intense excitement. It is notorious that patients who fear operations are liable to go into shock afterwards. There are also patients who do very well in a ward but who would turn their faces to the wall and die if put into a private room. They need the stimulation of seeing others. This type of fall in blood pressure cannot obviously be considered in dealing with the shock that follows immediately upon an injury, but it might quite readily add to the effect of toxins and thus contribute to the fatal result.

6. Loss of Carbon Dioxide

The possibility that a loss of carbon dioxide consequent on a stimulation of respiration by afferent impulses might be an important cause of shock was particularly emphasized by Yandell Henderson, and it appeared to receive support from the observations of Dale and Evans that the vasoconstrictor centre was thrown out of action by overventilation. This observation is true of etherized animals but does not apply to all animals anaesthetized in other ways, and it is not true of unanaesthetized man. J. S. Haldane was able by overbreathing to produce in himself an apnoea of two minutes without at the same time having a fall of blood pressure (Boothby).

Clinically it has been found that the administration of carbon dioxide is not of marked value, but here again we are in difficulty. If the vasoconstriction is already excessive, like that produced by adrenaline, carbon dioxide may even do harm.

Relation of the Adrenal Cortex

Of recent years we have heard much about the use of adrenal cortex in combating shock. I will deal shortly with the rationale of this treatment. We know that removal of the cortex results in a condition very much like shock and we know that such a procedure greatly enhances the sensitivity of animals to histamine (Dale, Kellaway, and Cowell). Our knowledge of the subject is as yet scanty, but the cortical hormone appears to exercise some

effect over capillary permeability and salt balance of the body. Because of this its use has been strongly advocated in shock with a view to increasing the capillary permeability. It is, however, evident that it cannot be expected to be efficacious in every type of shock. A few successful experiments have been published by Wilson and his co-workers, but here again there is urgent need for extensive investigation.

Conclusion

At the present stage of our knowledge we must conclude that shock is a clinical state that may be produced by several processes which are initially quite different and which may act separately or in conjunction. It is, however, quite unnecessary to assume that all shock is produced in the same way. It would therefore be quite wrong to dogmatize regarding treatment; much less should we attempt to apply the same treatment to all. We must know more accurately what factors are concerned in the particular case we are attempting to treat. To obtain this knowledge detailed investigation of large numbers of cases must be studied. To make all the necessary observations a great deal of labour is needed, and I suggest that at the present time those responsible for our medical services should consider the possibility of organizing on a wide scale the study of this subject, which may soon become a primary consideration of many of these doctors.

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NOTES ON RUBELLA

WITH SPECIAL REFERENCE TO CERTAIN RHEUMATIC SEQUELAE

BY

R. A. BENNETT, M.D., M.R.C.P.Ed.

Major, R.A.M.C.; Assistant Physician, No. 1 General Hospital, B.E.F.

AND

W. S. C. COPEMAN, M.D., F.R.C.P.

Major, R.A.M.C.; Assistant Physician, No. 3 General Hospital, B.E.F.

During the epidemic of rubella in February and March, 1940, more than 300 cases were observed. It was noticed that in a large number of these the onset and course did not follow the lines usually considered to be normal in this disease. It is thought, therefore, that these notes may be of interest in view of the fact that, as rubella does not ordinarily attract much attention and no observations have to our knowledge been published regarding it for some time, its course may have changed in some respects. Our observations may be divided into three parts: (1) differences in its onset and course; (2) differences in the complications from those described in most textbooks; (3) the question of relapses.

Onset and Course

In four cases the onset of rubella had been very acute. There had been a period of malaise lasting from twenty-four to forty-eight hours, during which a swelling of the mucous membranes of the nose, palate, and gums, without catarrh, was noticed, giving rise to considerable trouble. After that the patients experienced a sudden rigor with high temperature, and had stiff necks and occipital headache. They also complained of considerable muscular pain at this time, and one stated that the right wrist had swelled up. A diagnosis of meningitis was made in two of these cases, and appeared to be confirmed in the morning by the appearance of a rash of the type seen in cerebrospinal fever. Within a few hours, however, these symptoms had passed off, and the correct diagnosis was made. Another such case was diagnosed as "encephalitis," while the fourth was labelled "influenza." It is worthy of remark that all the cases seen during 1939 and also the first two weeks of the present epidemic were of an exceptionally mild type.

A progressive increase in the severity of the cases as the epidemic proceeded was noted, however. We had particular facilities for observing this fact as one of our hospitals was made the clearing-station for the British Expeditionary Force, and from the beginning of February until the end of March two batches of patients were admitted each week. The severer cases all occurred towards the end of the epidemic.

Rheumatic Sequelae

Osler (1939) states that there are no special complications of rubella, but mentions that in rare instances certain symptoms may occur, among which is arthritis. Ker (1934) states that rubella differs from other infectious diseases in that it shows a remarkable freedom from complications.

During the course of the epidemic described we have been much impressed with the occurrence of various "rheumatic" symptoms. Their grades of severity ranged from transient muscular pains that disappeared after twenty-four to forty-eight hours (15 per cent.) to cases that were indistinguishable clinically from severe rheumatic fever, one of which is described in detail below. The muscular pains appeared on the third day of the disease (taking the average of ten unselected cases), although two patients complained for the first time on the ninth day. These pains affected the shoulder-girdle in a majority of cases, and were most noticeable on movement of the arms or on turning in bed. In some cases, however, the onset was in the gluteal and thigh muscles. Occasionally, where the patient gave a history of having suffered from fibrositis in the past, it was the site of this old trouble which became reactivated. In one case fibrositis of the lumbar region had been experienced two years previously, and on the ninth day of rubella this returned and spread down the leg as "sciatica," which did not improve in spite of treatment. On account of this the patient was ultimately transferred to England. The patients who showed rheumatic complications were not always those who had had the septic throats referred to later, although in some cases this was so.

The following cases are chosen as being typical of the mild type of temporary muscular pains encountered.

Miss A., aged 29.—Admitted 3/3/40; discharged 14/3/40. Rash appeared 3/3/40. Throat and gums normal; swelling of occipital glands. Pains in joints began 4/3/40 in wrists, knees, and ankles. No swelling of joints. Rash disappeared in three days and pains in joints improved on disappearance of rash. Temperature 99° on admission; normal since.

Miss B., aged 24.—Admitted 8/3/40; discharged 17/3/40. Rash appeared 8/3/40, with severe pains in gums. Throat normal; occipital glands enlarged; gums appeared normal. Pains in joints 10/3/40—in wrists and ankles—which kept

her awake. No swelling. Rash lasted about four days. Joint pains and pains in gums disappeared when rash faded. Temperature 100.2° on admission. Next day 99°. Normal subsequently.

Miss C., aged 27.—Admitted 10/3/40; discharged 19/3/40. Rash appeared, with swelling of occipital glands, 9/3/40. Throat sore 11/3/40. Throat inflamed. No pain in gums. Rash lasted three days, then patient complained of pains in small joints of both hands. First interphalangeal joint of middle finger of left hand and both metacarpo-phalangeal joints of thumbs considerably swollen. This swelling lasted until about two or three days before discharge. Temperature 101.4° on admission; next day 101.6°–101.4°; following day 99.2°–99.8°. Normal subsequently.

Miss D., aged 39.—Admitted 18/3/40; discharged 4/4/40. Rash appeared 18/3/40, lasting four to five days. Pain in gums on admission, lasting three to four days. Throat normal; occipital glands much swollen and slightly tender; gums appeared normal. Pain in joints started 17/3/40 in wrists, shoulders, and knees, lasting six days and keeping her awake at nights. No swelling. Has been very "run down" since.

In other patients these muscular pains did not disappear so rapidly. Effusion into one or more joints also occurred, and this lasted for a considerable period. The following case is typical:

Sister E., aged 37.—Admitted 3/3/40; discharged 2/4/40. No rheumatism previously and always in good health. She had been in hospital with "flu" and had returned to duty for four days, when she developed rubella. She had a typical rash, and in addition to the posterior cervical glands those of the groin were considerably swollen. She had a slight sore throat, for which she was given a gargle. She did not at any time feel very ill. She was worried by the fact that her nose seemed congested, however, and she could not breathe easily through it. There was no coryza. On the third day all her gums became very painful and the teeth sore. She thought the palate was also swollen, but the nose had cleared. The eyes, which had been very sore for several days, also cleared. Aspirin had no effect on the "toothache." On the fourth day she complained of low lumbar pain and, later in the day, aching of the ankles, hips, and wrist. On the fifth day the outer two fingers were swollen (mid-phalangeal joints) and became more painful throughout the day. The next day the pain was less, and on the seventh day pain had disappeared from all the joints. Slight swelling, however, was still present in the two fingers when seen a fortnight later.

As an example of the most severe type of rheumatic complication the following case will be of interest. The patient was eventually evacuated to England with what appeared to be true rheumatic fever and a loud cardiac murmur, which had developed during the illness.

Driver F., aged 23.—Admitted on February 14, 1940, with a rubella rash of three days' standing and an enlargement of cervical glands; also complained of slight sore throat and cough. On the 19th his left tonsil and glands were swollen, and he was given sulphanilamide 3 grammes daily for five days. Appetite was very poor. Next day he complained of severe headache for the first time, which aspirin relieved. On the 24th he felt very much better and appetite returned; and on the 26th he sat up in a chair for two hours. That night he was restless and his temperature rose to 99°. Tonsils were still large. Sulphanilamide was resumed in the same dosage on the 28th, when his temperature was 101° F. He started to complain of aching pain in both shoulders, which became acute on movement. Lin. methyl. salicyl relieved this. The patient remained more or less in this state until March 7, the temperature gradually coming down from 103° (March 2) to 99.8° F. The pulse was raised; there was a loss of appetite; colour was poor, with cyanosis often at night; and he had a slight headache continuously. He used to feel rather better in the early evenings, although pain in the shoulders became worse between 8 and 9 p.m. He used to experience profuse sweats twice in the twenty-four hours—at 2 a.m. and 2 p.m. These did not seem to bear any relation to the aspirin which he was taking. He was seen by the ear, nose, and throat specialist, who reported that there was no active inflammation of the tonsil, although the tonsillar glands were enlarged and some muco-pus was seen.

On March 11 the temperature, after being down for two days, rose to 100.4°, and pain occurred behind the knees as well as in the shoulders. The pulse rate increased to 100, and a systolic murmur became audible which was loudest at the apex and was conducted towards the axilla. There was some visible throbbing of the carotids. The patient looked very pale. On March 13 he was still in this condition, and complained in addition of lumbar pain and slight swelling in the left wrist with pain running up the forearm. He was seen in consultation by Major-General R. Priest on this day. His B.S.R. (Westergren) was 56 mm. By March 17 he felt considerably better and had very little pain. The swelling had left the wrist, but his evening temperature was 99°. The cardiac murmur was still present. On the next day he was evacuated to England. This patient was on sulphanilamide 3 grammes daily from February 28 to March 1 inclusive, with no apparent effect. He received temporary relief from aspirin throughout, however. His case appeared to be rheumatic fever arising during the course of rubella. A follow-up note was received from him on April 9 from another hospital stating that for some days after arrival pains had been very severe in his wrists, and he had not been able to feed himself. Subsequently he improved and felt fairly well, and after the first week his temperature was normal. His case was diagnosed as subacute rheumatism and carditis, and he was told he must remain in bed for two months longer.

Other Complications

Other unusual complications of rubella were also observed:

The Temperature.—We noticed a secondary rise of temperature in about 10 per cent. of our cases, following an apyrexial period of forty-eight hours or more. This secondary rise generally reached about 101°, and was accompanied by malaise and by increased swelling with some pain in the enlarged lymphatic glands. Ker states that the temperature in rubella is usually only slightly elevated, in adults often only to 99°, and is seldom maintained for more than one or two days.

The Throat.—We were much struck with the fact that while most of our patients complained of some degree of sore throat a large number of these throats when examined appeared to be very much worse than would have been expected. Yellow follicles were present, and often a considerable amount of pus in addition. Of the first 133 patients seen forty-five had apparently very bad follicular tonsillitis and were put under the care of the throat specialist, although they had themselves complained very little of their throats. Ker states that the majority of rubella patients complain of slight sore throat and there is some mild congestion of the fauces; while Tidy (1938) states that the fauces may show "dryness and slight redness."

The Gums.—A large number of our patients complained of a complication to which we have been unable to find any reference in the books consulted. This was described by many patients as "toothache." On further investigation, however, it appeared that it was in reality an intense aching of the gums. This lasted for forty-eight hours and was severe enough in some cases to keep the patient awake at night. It started on the second day in most cases. In certain others, however, it was a feature of the onset. It was noted by one of us that in those cases

the patient's temperature was higher than is considered normal for rubella, sometimes rising to over 101° F.

Glandular Enlargement.—Generalized glandular enlargement was another prominent feature of this epidemic, as opposed to enlargement merely of the posterior cervical region, which ordinarily subsides on the third or fourth day after the appearance of the eruption. A small group of cases were admitted with "fever," fairly severe sore throat, and generalized enlargement of the lymphatic glands. Neither liver nor spleen was palpable in these cases. The clinical picture, apart from the rash, was very suggestive of glandular fever. A white blood count was done in these cases, and in the majority this showed a leucopenia with a relative lymphocytosis, lymphoblasts being present in some cases. The glandular enlargement, seldom with tenderness, remained for ten days or more, and a further blood count in some of the cases before discharge from hospital showed a return to normal.

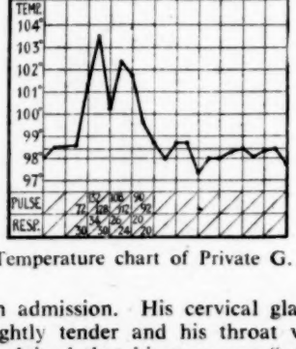
Case	Day of Disease	Total White Cells	Polymorphonuclears %	Lymphocytes %	
I	4th	5,300	53	41	Transitional 4%
II	5th	6,700	51	42	Lymphoblasts 4%
	10th	7,200	70	27	
III	2nd	5,900	42	46	Lymphoblasts 4%
IV	7th	3,700	25	71	
V	2nd	4,700	46	50	
	9th	8,350	32	37	Large mono's 22% Lymphoblasts 2% Eosinophils 4%
VI	2nd	8,800	55	32	Large mono's 6% Lymphoblasts 4%
	9th	8,500	64	32	Large mono's 1% Lymphoblasts 7%
VII	4th	2,850	54	33	Eosinophils 4% Large mono's 2%
	10th	7,850	52	35	Eosinophils 2% Large mono's 11%

A further peculiarity which was much commented upon by the sisters in charge of the wards was the fact that desquamation of the skin occurred in a large number of cases as soon as the rash had faded. This was often as intense as that seen after severe scarlet fever, and affected the hands particularly.

Relapses

Box, writing in Price's *Medicine* (1937) on rubella, states that "second attacks are known, but not common, and relapse is very rare." In the present epidemic relapses have occurred in about 8 per cent. of all our cases. Some of these were very mild, but in three cases it was acute and was mistaken at first for the onset of meningitis, which it was believed to be for twenty-four hours. The relapses in these three cases were similar to the cases of acute onset described above. The following is an account of one of them:

Private G., aged 21 (see Chart).—He was admitted on March 6 with rubella; the rash had appeared on March 3 and had



Temperature chart of Private G.

already faded on admission. His cervical glands were much enlarged and slightly tender and his throat was rather red; he had also complained that his nose was "choked up," and douching and inhalations were begun. He appeared to be convalescing normally until 3 a.m. on March 15, when he wakened and vomited two ounces of watery fluid. He then slept for an hour, when he awoke again complaining of intense headache behind the eyes and in the occipital region. He also complained of severe thirst and blocking of his nose. His temperature was 101.2°, pulse 130, and respirations 30. Aspirin was given with slight relief. He dozed at intervals until 6 a.m., when his temperature was 103.2°, pulse 130, and respirations 30, and photophobia was marked. At 7.40 a.m. no rash was present.

At 9.30 a.m. his condition was similar, and there was some tenderness over the region of the frontal sinuses and slight nasal discharge. There was increase of pain in bending his neck forward, but otherwise no neurological abnormality. He felt better towards the evening, and on the next day his temperature was 99.5°, the headache had gone, as had the frontal tenderness, and the rash was typically rubelliform. He made an uneventful recovery from this point, and was discharged ten days later.

Two cases were observed in which patients developed true measles within ten days of recovery from rubella. These were at first believed to be relapses of rubella, but the subsequent course of the disease showed it in each case to be morbilli.

Summary

In a recent epidemic of rubella certain deviations from the normal were observed. These are described, and concern the onset, course, and complications of the disease. Certain cases of relapse are also described and commented upon.

The most important complication described is the occurrence of "rheumatic" conditions of varying degrees of severity. These ranged from transient joint and muscle pains to severe lumbago and sciatica, for which the sufferers had to be hospitalized. Three cases also occurred that were clinically indistinguishable from rheumatic fever. One of these is described in detail.

Other unusual complications observed frequently were severe pains in the gums; tonsillitis, which appeared to be severe but of which the victim seemed to be almost unaware; and an intense degree of desquamation, occurring within a few hours of the rash having faded. Generalized adenitis with a temporarily abnormal blood count showing leucopenia with relative lymphocytosis was not infrequent, whilst a secondary rise of temperature forty-eight hours after defervescence with a recurrence of constitutional symptoms was also noticed in a considerable number of cases.

Our thanks are due to the following, who have helped us in the preparation of this account: Major-General R. Priest; Colonels A. C. Hammond Searle and A. L. Foster, the Commanding Officers of No. 1 and No. 3 General Hospitals; Major Ross Muir and Lieutenant J. Landells, and the Sisters concerned. Our thanks are also due to Colonel G. Wilson, Deputy Director of Medical Services, British Expeditionary Force, for permission to forward these notes for publication.

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I. Dogramaci, *Annal. Paediat.*, 1940, **154**, 357, made a study of ninety cases of erythema nodosum which occurred among 53,000 Turkish children examined between March, 1934, and December, 1939. The ages ranged from 2 to 16 years, the maximal incidence being between 8 and 10 years: forty-four were boys and forty-six girls. The incidence was highest in the winter (October to February, thirty-seven) and lowest in the summer (June to August, thirteen). Of thirty-nine tested with tuberculin four were negative and thirty-five positive. In one of the negative cases erythema nodosum followed typhoid fever.

THE BASAL METABOLISM TEST IN THYROTOXICOSIS

ITS VALUE TO THE CLINICIAN

BY

LAURENCE MARTIN, M.D., M.R.C.P.

Leverhulme Scholar of the Royal College of Physicians

(From the Department of Medicine, Cambridge University)

All laboratory aids to clinical medicine ultimately come under critical review, when, after an adequate period of use and abuse, the clinician can fairly assess their limitations and the help they afford. The clinician, as such, is not concerned with the laboratory technique of various procedures, beyond the assurance that these are scientifically sound and are performed by skilled hands. Experience has shown that certain laboratory aids—for example, blood counts in pernicious anaemia and blood-sugar estimations in diabetes—are indispensable for adequate treatment or diagnosis, while others—such as the estimation of basal metabolism in thyrotoxicosis and the test for occult blood in the faeces in peptic ulcer—although of definite value, are not indispensable.

The purpose of this paper is to consider the position of the basal metabolism estimation in thyrotoxicosis and to evaluate its aid to the clinician in diagnosis, assessment of severity, and treatment. The subject can conveniently be considered under three headings.

Diagnosis

For practical purposes thyrotoxicosis may be said to occur in three main forms—namely, (1) florid, in which the classical symptoms and signs render the diagnosis obvious; (2) masked, in which classical signs are minimal or absent and the disease exists behind a façade of cardiac failure or muscular wasting; and (3) borderline cases, in which signs and symptoms are suggestive but a confident diagnosis cannot be made at the first examination.

Florid Cases.—The B.M.R. can only be confirmatory of the condition that is clinically evident, and patients would lose nothing were the test not performed.

Masked Cases.—A raised B.M.R. is valuable in clinching the diagnosis, although many clinicians would back their opinion to the point of advising thyroidectomy without its aid. Parsons and Twort (1939) reported an example of thyrotoxic myopathy in which a high B.M.R. proved thyrotoxicosis to be the cause of great muscular wasting in a man with none of the classical symptoms and signs. In this instance the B.M.R. put the diagnosis beyond doubt and the man was cured by thyroidectomy. In masked cases where the presenting symptom is cardiac failure, with or without auricular fibrillation, the patient may be too ill to undergo the test, and a diagnosis of thyrotoxicosis on clinical grounds alone must suffice for thyroidectomy, which may be almost an emergency operation. In other cases caution is needed in choosing the time to estimate the B.M.R., as well as in interpreting the results. Cardiac failure of non-thyrotoxic origin may of itself cause a raised B.M.R., and in doubtful cases a therapeutic test with iodine, after relief of failure, will cause a further fall in the B.M.R. if thyrotoxicosis is present. It must be admitted that thyrotoxicosis has been reported with a normal B.M.R. (Plummer, 1931; Morris, 1931), and in some cases the diagnosis was proved histologically but the B.M.R. level remained unaltered after thyroidectomy.

Borderline Cases.—In these cases, also known as "formes frustes," autonomic imbalance, or neuro-circulatory asthenia, signs and symptoms suggestive of thyrotoxicosis may be present, often with an enlarged thyroid as well, yet the B.M.R. is within normal limits and thyroidectomy does not improve the symptoms (Kessel and Hyman, 1923; Rasmussen, 1937; Prioleau, 1939). Much controversy, summarized by Möller (1927), has centred round these cases, the nature of which has been variously suggested as (1) Graves's disease without raised metabolism, (2) Graves's disease in persons with a subnormal B.M.R. in whom the disease has only raised the basal metabolism to normal levels, and (3) an entity entitled "Basedow's disease with no thyrotoxicosis" (Rasmussen, 1937). Möller himself considered that a raised B.M.R. was not essential for the diagnosis of thyrotoxicosis, for he regarded it as a sign which might equally be absent with other cardinal indications such as goitre or exophthalmos. Such an extreme view is justified if borderline states of thyrotoxicosis can be diagnosed confidently on clinical grounds alone, otherwise many unnecessary thyroidectomies will be done. It has been shown that in myxoedema the metabolic level is to some extent independent of symptoms (Dodds and Robertson, 1933); for the B.M.R. of a patient was raised to + 30 per cent. by dinitro-*o*-cresol without relief of symptoms, yet with thyroid extract symptoms were relieved at a B.M.R. of + 10 per cent. A similar principle may hold good in thyrotoxicosis, but it cannot be demonstrated as yet, for, apart from iodine, which also ameliorates the symptoms, we have no drug capable of lowering the B.M.R. Whatever views are held regarding borderline cases or whether a raised B.M.R. is essential for the diagnosis of true thyrotoxicosis, the fact remains that thyroidectomy does not relieve the symptoms of patients with autonomic imbalance, and, as with mild cases of undoubted thyrotoxicosis, surgeons are loath to operate upon them. For this reason estimation of the B.M.R. is of great value, as a reading within normal limits is a warning that thyroidectomy will not relieve symptoms. Dunhill (1937) stated that, apart from "formes frustes," he generally decided on the advisability or otherwise of operation in thyrotoxicosis on clinical signs and symptoms alone, while Hamilton and Lahey (1922) emphasized the need for discretion when interpreting the results of the borderline cases.

To summarize—in the diagnosis of thyrotoxicosis the B.M.R. seems to be superfluous in florid cases, of confirmatory value in masked cases, and of considerable value in borderline cases as a means of identifying the patients upon whom thyroidectomy would confer little or no benefit.

Assessment of Severity

The severity of thyrotoxicosis can only be assessed by taking into account the whole clinical picture, many components of which are rather intangible and incapable of expression by figures. The degree of nervousness and the amount of cardiac damage cannot be expressed numerically, while figures for pulse rate, loss of weight, size of neck, and degree of exophthalmos are variable individual factors and cannot serve as standards of comparison. The raised B.M.R. reading, as a factor common to nearly all cases of thyrotoxicosis, has therefore been seized upon as a means of estimating the absolute severity of any one case and of comparison with others. This has been most unfortunate; for it has fostered the illusion that a raised metabolism is the central point of cause, symptoms, and treatment in thyrotoxicosis.

Estimation of the severity of any disease resolves itself into an assessment of the most dangerous components, and in thyrotoxicosis there are at least three possible causes of death—namely, wasting from hypermetabolism, cardiac failure, and acute psychosis. The B.M.R. is only an index of the first of these, and hence cannot be a fair estimate of severity in every case or a reliable standard of comparison for all. It is common experience that a patient with thyrotoxic heart failure may be at death's door with a B.M.R. of + 40 per cent., yet a patient with exophthalmic goitre and a B.M.R. of + 70 per cent. may cause no undue anxiety. The clinical picture of thyrotoxicosis is a mosaic of which hypermetabolism is but a constituent fragment and not, of necessity, the centrepiece.

Treatment

As a means of indicating the right moment for operation repeated B.M.R. readings cannot be said to give more information than clinical observation of the pulse rate, weight chart, and general appearance of the patient—in short, consideration of the whole clinical picture. The main point in judging the moment for thyroidectomy is that the patient shall be improving in a remission induced by adequate iodine administration, which can be recognized accurately by clinical methods. We know that the B.M.R. falls coincidently with improvement of symptoms under iodine medication, but this is no reason for trusting to one sign rather than to the whole picture.

Many surgeons have ceased using the B.M.R. for this purpose, although Means (1937) states that he notes it every few days during pre-operative iodine therapy until a new low level is obtained. Lehman and Shearburn (1939), however, complained that no hard-and-fast criteria existed for assessing improvement under pre-operative iodine. They found no relation between the initial height of the B.M.R. and the duration of iodine therapy necessary before operation. Further, they found no relation between the initial height of the B.M.R. or duration of pre-operative iodine therapy and subsequent post-operative reaction—as judged by pulse and temperature readings.

As regards *x*-ray therapy, it is doubtful if the B.M.R. is of much assistance in checking the progress of a case under treatment. Möller (1927) was unable consistently to correlate alteration of the B.M.R. level with clinical change in patients undergoing *x*-ray therapy, and concluded that it could not be trusted as an accurate index of progress.

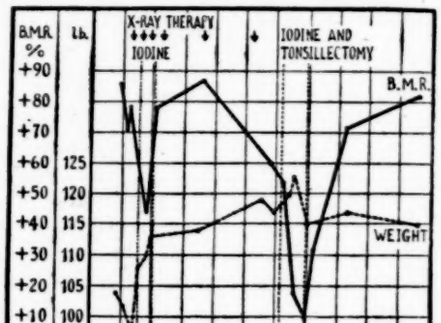
The following case is an example of striking clinical improvement and gain of weight in a thyrotoxic patient, whose B.M.R. has remained at a remarkably high level in spite of *x*-ray therapy.

Illustrative Case

A housewife aged 25 attended the out-patient department of Addenbrooke's Hospital, Cambridge, in November, 1937, after an attack of tonsillitis in October of the same year. In April, 1937, her friends had remarked on the goitre and the staring eyes, which the patient herself had not noticed. She felt quite well in herself, was not nervous, and had no excessive sweating or dislike of hot weather. Her weight then was 7 st. 7 lb., her highest known weight having been 9 st. in 1931. Her appetite was not remarkable and had not increased. Mild primary thyrotoxicosis was diagnosed, and as active treatment did not seem called for she was treated by sedatives.

She attended the out-patient department again in August, 1938, having remained well except for amenorrhoea since November, 1937. Her weight was 7 st. 11½ lb. In September, 1938, she was admitted to hospital under Professor J. A. Ryle. Her weight was 7 st. 6½ lb. in nightclothes. There was a fine tremor of the hands, but she was not nervous or flushed. The pulse was regular at 120 a minute, with a diffuse forcible apex beat, maximum in the fifth space four inches from the midline. The blood pressure was 175/90. She had a moderate-sized smooth symmetrical goitre and the following eye signs: marked exophthalmos, lagging of the upper lids, widened palpebral apertures, and a smooth forehead on looking upwards. The tonsils were large and fleshy but not obviously inflamed.

On clinical grounds she was considered to have a mild to moderate degree of primary thyrotoxicosis. Considerable surprise was caused by a B.M.R. reading of + 86 per cent., confirmed during the ensuing few days by further results of + 71 per cent. and + 79 per cent. She would not consent to thyroidectomy, and in view of her good general condition *x*-ray therapy was recommended, with tonsillectomy later if necessary. She was subsequently admitted on four occasions for tonsillectomy and B.M.R. readings. The accompanying chart shows the further progress of her weight, B.M.R., *x*-ray therapy, and the occasions when she was given iodine. It shows that she has maintained her increased weight despite



an astonishingly high B.M.R. level, and that iodine was able to lower the B.M.R. temporarily.

The patient remains under observation, leading a normal life in her home, and attends hospital for *x*-ray therapy. Despite the high B.M.R. she feels perfectly well and has given no cause for anxiety, either after tonsillectomy or at any other time. The eye signs persist unchanged, but the goitre is now barely visible or palpable. The pulse rate remains in the neighbourhood of 100, and for this reason she may still be pressed to undergo thyroidectomy. However, no matter what the future course of this patient may be, she illustrates very well the complete lack of relation between B.M.R. readings and the clinical state, both as regards degree of severity and progress under *x*-ray therapy.

Estimation of the B.M.R. after thyroidectomy is valuable to the surgeon as a check upon the amount of thyroid tissue removed. Post-operative myxoedema may be anticipated, and substitution therapy instituted and regulated before symptoms appear, so that in this respect the B.M.R. can give more information than clinical observation alone.

Conclusions

Virtually all cases of thyrotoxicosis have a raised B.M.R.; but hypermetabolism is only a part of the symptom-complex, and is neither a sound index of severity of any particular case nor a reliable standard of comparison.

For diagnostic purposes it is confirmatory in florid and masked cases, and has its greatest value in borderline cases, where a normal reading is a warning against thyroidectomy.

As a means of indicating the right moment for thyroidectomy during pre-operative therapy or checking progress during *x*-ray therapy it does not surpass clinical observation, but it is a valuable means of indicating post-operative myxoedema before symptoms appear.

My thanks are due to Professor Ryle for permission to quote details of the case and to Dr. Lawrie for the B.M.R. figures. The *x*-ray therapy was given by Dr. Ff. Roberts.

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CONVULSIONS AFTER VINESTHENE ANAESTHESIA

BY

F. K. BOSTON, M.B., B.Ch., D.A.

(From the Nuffield Department of Anaesthetics, the Radcliffe Infirmary, Oxford)

Reports of convulsions occurring in connexion with vinesthene anaesthesia (divinyl ether) are rare. A few instances have been reported *during* the course of anaesthesia, but the recent paper by Massey Dawkins (1940) describing convulsive attacks in five patients differs from previous reports in that the convulsions came on *after* the anaesthesia was over. A further series of five cases has since been reported by Drs. Guerrier and Dafoe (1940). These are the only reports I can find of the occurrence of this phenomenon after anaesthesia. H. S. Ruth (1934) reported the occurrence of convulsions following laryngospasm and cyanosis during the course of anaesthesia with divinyl ether in one patient. The convulsions occurred while the patient was in about the middle of the third stage of anaesthesia, and ceased fairly quickly on the administration of oxygen. Massey Dawkins (1938, 1940) has also reported four cases occurring during the course of vinesthene anaesthesia which were clinically indistinguishable from ethyl ether convulsions. In two patients the convulsions ceased on administration of evipan sodium. The other two recovered after stopping the administration and raising the head. I have been unable to find any other references to this complication appearing either during or after vinesthene anaesthesia. The following detailed report may therefore be of interest.

Case Record

On October 12, 1939, I was attending a school dental clinic to anaesthetize children requiring dental extractions. A 3-c.cm. vinesthene ampoule was used in a Goldman's inhaler for each patient. The mask was applied to the child's face and retained there until automatic respirations supervened, when it was removed for the extractions. The subject of this report was a normally developed boy of 5 who required extraction of four temporary molars. He appeared in good health. The onset of anaesthesia was normal and quiet, but soon after loss of consciousness he developed a mild inspiratory laryngeal stridor which restricted his tidal exchange sufficiently to cause a slight degree of cyanosis. Stridor and cyanosis were both abolished within a few seconds of removing the mask for the start of the extractions. The subsequent course of anaesthesia was uneventful and the teeth were removed without difficulty. The child, however, did not recover in the usual way, but remained in a semiconscious state. He lay in the dental chair with both eyes fixed upwards and to one side, and did not respond to auditory stimuli or slapping. His colour, pulse, and respiration were normal. During the next ten minutes his condition remained about the same. Slight fibrillary twitchings around both eyes now developed. After these had continued two or three minutes he was laid on a couch. The twitching round the eyes rapidly became more intense and within five minutes he developed severe generalized convulsions. Cyanosis appeared rapidly, and was only partially checked by the administration of oxygen. No barbiturate was obtainable with which to control the convulsions. After the small oxygen supply was exhausted cyanosis at first became extreme. Subsequently his colour became ashen, his pulse became weaker, and he appeared in danger of death. The whole period of convulsions lasted twenty-five minutes, at the end of which the patient suddenly passed into a stertorous sleep disturbed by slight semi-convulsive movements of the body and limbs. His colour returned nearly to normal. After three-quarters of an hour the movements had almost ceased. About fifteen minutes later he recovered consciousness. When seen by his family doctor about forty-five minutes later he was complaining of pain in his abdomen. Soon afterwards he passed two large motions within a short interval. Next morning he was quite well. He has remained so since.

The boy is the youngest of five children, all alive and well. A brother now 18 had had convulsions when between the ages of 2 and 5 at a period when he was stated to be very constipated. After the last convulsion when 5 years old he passed two ascarides lumbricoides. He has had no fits since. The subject of this report has always been healthy. He once had a "convulsion" after swallowing a large piece of orange when 3 years old. He also is very constipated, but has never passed any ascarides. The parents give no history of convulsions.

Comment

The sequence of events in this case appears to follow almost exactly that described by Massey Dawkins (1940) in his report of five cases of convulsions *following* vinesthene anaesthesia, and by Guerrier and Dafoe (1940) in five similar cases. It is difficult to give any satisfactory explanation of these phenomena. The condition is uncommon. This is the only case I have had in 500 administrations. Massey Dawkins gives the frequency as 1 in 442, and Guerrier and Dafoe as 1 in 1,096. It would be interesting to know (*a*) whether laryngospasm was present during the preceding anaesthesia, and (*b*) whether constipation is a usual concomitant. The appearance and course of the convulsions seemed to me to be remarkably similar to those I have witnessed under ethyl ether. The type occurring during *prolonged* vinesthene anaesthesia is also said to be clinically indistinguishable from deep ethyl ether convulsions. This raises the question as to whether the ethyl ether type and the two vinesthene types are not really different aspects of the same thing. It is notable that all the cases of convulsions after vinesthene have occurred following the very short period of anaesthesia necessary for dental extractions. When anaesthesia has been prolonged, convulsions have appeared during the course of the operation. If a common incident fires off the convulsions in each type the very short period of anaesthesia required for the extractions may be over before the appearance of the convulsions which have been initiated by some interplay of factors between the patient and the anaesthetic.

The sample of vinesthene was from one of a series of 3-c.cm. ampoules put up by the makers, Messrs. May and Baker, for use with a Goldman's inhaler. As it was completely used up during the administration it could not be tested for impurities, but the rest of the ampoules in the box were employed clinically without the appearance of any untoward symptoms.

I am indebted to Dr. T. L. Crawhall for details of the patient's subsequent progress, and for his past and family history.

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According to the annual report for 1939 of the Council of the Pharmaceutical Society, presented at the annual meeting on May 15, the number of names of the pharmaceutical chemists and druggists on the register was 24,661 (an increase of 471). Of these 1,578 were registered as pharmaceutical chemists. The number of apprentices or students registered during the year was 651, and the number of registered premises was 15,381.

AGRANULOCYTOSIS FOLLOWING CHEMOTHERAPY WITH SMALL DOSAGE

BY

ALEX W. SPAIN, M.A.O., M.R.C.O.G.

Mater Misericordiae Hospital, Dublin

Many cases of agranulocytosis following sulphapyridine and sulphanilamide therapy have been published. According to L. Colebrook (*Journal*, March 16, p. 450) more than fifty cases had been reported in the last two years. He says: "The particulars of published cases strongly suggested that this dangerous condition (it had a mortality rate of about 50 per cent.) was closely related to the amount of drug given and the duration of treatment. The average total dose in the recorded cases had been 50 grammes and the duration of treatment twenty days." The case here reported is worthy of record on account of the small dosage (4.5 grammes of sulphapyridine and 4.5 grammes of sulphanilamide), the short duration of treatment (four days), and the fact that despite early diagnosis and prompt treatment it proved fatal.

Case Report

A primipara aged 26 had a lower-segment Caesarean section performed on February 5, 1940, before labour had started. The blood loss was moderately heavy. Convalescence was uneventful until February 12, when a rash resembling that of rubella developed. In the evening the temperature rose to 101° F. The rash disappeared within thirty-six hours, but the temperature was again 101° F. on the evening of February 13. A small haematoma was now discovered at the lower end of the wound; this was opened with a dressing forceps and a small quantity of clot and pus evacuated.

On the morning of February 14 (tenth day after operation) her temperature was again 101° F., and she now complained of tenderness in the outer and lower quadrant of the right breast. Antiphlogistine applications were ordered to the breast, and the patient was given a tablet of sulphapyridine (0.5 gramme) every sixth hour. Next day the affected part of the breast was hard and tender and the evening temperature was 103° F. Treatment with local applications was continued, but a change was made to sulphanilamide 0.5 gramme every hour. (This change was made inadvertently.) On February 16 she felt better and the breast was less hard and tender. Her temperature had dropped to 99° F. and her pulse was 80. It appeared that the mastitis was subsiding without abscess formation. Chemotherapy was continued for a further two days. From February 14 to 18 she received 4.5 grammes of sulphapyridine and 4.5 grammes of sulphanilamide.

The patient continued to improve, and appeared almost to have recovered from the mastitis by February 20. All tenderness of the breast was gone, though there was still some thickening. She now felt quite well and was hoping to be allowed up in a day or two.

When seen on the morning of the 21st she complained of a slight "sore throat" and her temperature was 102° F. At the time an epidemic of influenza, of which "sore throat" was a marked feature, was widespread in the city. It was considered that she had developed "influenza." Her temperature at 6 p.m. on the same day was 99.4° F. and pulse rate 100; she still complained of the throat, though no lesion could be seen. She looked rather more ill than she should if her condition was influenza. The possibility that the condition was agranulocytosis was considered, but this was regarded as very improbable in view of the small dosage and the similarity of the symptoms to those of the epidemic of influenza. However, her appearance was not satisfactory, so I got in touch with Professor McGrath with a view to having a blood examination made. That evening she had a rigor at 7.30 and her temperature rose to 105° F. It fluctuated around this level until her death four days later.

A blood count done by Professor McGrath at about 9.30 p.m. showed marked agranulocytosis with severe secondary anaemia (see table). Within an hour of the receipt of the report on her blood she was given 10 c.cm. of pentnucleotide intramuscularly. This was followed immediately by a transfusion of 450 c.cm. of citrated blood, and one hour later she received a further 10 c.cm. of pentnucleotide. Subsequently during her illness she was given 10 c.cm. of pentnucleotide every sixth hour, save in the last twenty-four hours, when it was administered every five hours. Thus in the first twenty-four hours she received 50 c.cm. of pentnucleotide, in the second twenty-four hours 40 c.cm., in the third twenty-four hours 40 c.cm., and in the last twenty-four hours 50 c.cm. In addition she was given two further transfusions of citrated blood, each of about 450 c.cm., on the second and third days of the agranulocytosis. Daily blood counts were made (see table). The leucocytes numbered 1,920 on the first count (February 21); by February 23 they had fallen to 960, and on February 25 had risen again to 1,280. The neutrophils, which were only 1 per cent. of the total white cells at the first count and which remained at this level for three days, constituted 59 per cent. of the total white cells on February 25.

Table showing Daily Blood Counts

Date	Red Cells (millions) per c.mm.)	Haemoglobin	Colour Index	Leucocytes per c.mm.	Lymphocytes		Neutrophils	Other Granular Cells
					Small	Large		
		%			%	%	%	%
Feb. 21	2.49	36	0.7	1,920	21	77	1	1
„ 22	2.29	42	0.9	1,280	40	58	1	1
„ 23	1.89	45	1.2	960	20	76	1	3
„ 24	2.54	50	1.0	960	34	62	2	2
„ 25	3.27	65	1.0	1,280	17	24	59	0

In spite of active treatment and her response to pentnucleotide she died on the fifth day of her illness. Her clinical condition had become steadily worse, and on no occasion showed any tendency to improve.

CONDITION OF THROAT AND PALATE

February 21: No lesion obvious; soreness complained of by the patient. February 22: A few small vesicles, about the size of the head of a large binder pin, were observed on the right side of the soft palate and on the right tonsil. February 23: The vesicles were now seen all over the soft palate. February 24: The vesicles were replaced by whitish patches. This appearance was also present on the 25th, the day of death. No evidence of oedema of the throat or larynx was observed at any time.

I am greatly indebted to Professor John McGrath, M.D., for the blood examinations and for much helpful advice. I am also indebted to Mr. Andrew L. Butler, M.Ch., for advice about the blood transfusions, which he administered.

St. Andrew's Hospital for Nervous and Mental Diseases at Northampton, according to its report for 1939, admitted 166 patients during that year, and its average daily number was 500 patients, certified, voluntary, and temporary. In spite of a state of emergency the work has proceeded without interruption. The medical superintendent, Dr. Thomas Tennent, mentions the use of insulin and cardiazol in the treatment of cases of schizophrenia. Since the treatment by insulin was introduced in August, 1938, twenty patients have received a full course. The variation in the response to the dosage of insulin was noteworthy. In one patient the method was abandoned, as 1,000 units failed to produce coma. Of the twenty patients, eight improved clinically to such an extent that it was possible for them to return home, and some degree of improvement was noted in the remainder. Forty patients suffering from schizophrenia received one or more courses of cardiazol, and of this number one-half improved clinically to such a degree as to make it possible for them to leave the hospital, and according to the most recent reports their improvement has been maintained.

Clinical Memoranda

Pneumococcal Peritonitis Treated with Soluseptasine and Sulphapyridine

The girl whose case is reported below was obviously *in extremis* when admitted to hospital, and could not have been expected to live many hours, apart from the nature of the infection. The amazing effect of soluseptasine was evidenced by her condition the following morning, when there seemed a bare chance of her surviving. Even when running a fairly high remittent temperature her general condition gave no cause for anxiety. It is notable that there was very little discharge from the wound, and perhaps the peritoneum need not have been drained. The association of choreiform movements and their disappearance *pari passu* with improvement in her general condition are interesting.

CASE RECORD

A girl aged 8 was admitted to the East Suffolk and Ipswich Hospital on November 16, 1939, with a two-days history of acute abdominal symptoms—namely, generalized abdominal pain, vomiting, and diarrhoea. Blood was not passed per rectum. Four weeks previously choreiform movements of the arms and legs were noticed, and she had been kept in bed at home till the onset of the above symptoms.

On admission she had a typical peritoneal facies, sunken and dusky cheeks, blue lips, rapid respiration, labial herpes, foul dry tongue, and an almost uncountable pulse. She was only vaguely conscious, and lay inert, with occasional twitchy movements of arms and legs, and from time to time uttered a short meningitic cry. The abdomen was distended and rigid all over, and pressure roused her enough to scream momentarily. Per rectum there was bogginess in the pouch of Douglas but no definite mass. Kernig's sign was negative and there was no very definite nuchal rigidity. The heart appeared to be normal.

A diagnosis of advanced general peritonitis, probably pneumococcal, was made. Under open ether the abdomen was exposed by a short midline subumbilical incision, and was found to be full of greenish-yellow inodorous pus. This was rapidly siphoned off and drainage tubes inserted, one down to the pelvis and another upwards towards the liver. As the appendix was normal the diagnosis seemed to be so far confirmed, and four doses of soluseptasine, 2.5 c.cm. of a 10 per cent. solution, were given intramuscularly at four-hourly intervals.

The next morning she was much better, and sulphapyridine (M & B 693), 0.5 gramme four-hourly, was started, being continued till November 21, when her temperature was normal and the choreic movements were much less. She looked and felt well, though there was still some abdominal distension. The diagnosis had in the meantime been confirmed by direct examination of a swab taken at operation. As there was very little drainage from the wound the tubes were removed and not reinserted. Two days later (November 23) the evening temperature rose to 102°, and sulphapyridine, 0.25 gramme, was given three times a day. The patient still looked and ate well, and was bright and cheerful. The convulsive movements had entirely ceased and the wound had healed. Nevertheless her temperature remained swinging from 99° to 102° and the pulse between 120 and 140.

On December 7 Dr. Donald Jones saw her in consultation, considered the tachycardia and fever due to septicaemia only, and advised a further intensive course of sulphapyridine —namely: first day, 1 gramme six-hourly (4 grammes); second, third, and fourth days, 0.5 gramme four-hourly. The heart was not enlarged and there were no murmurs. In spite of her excellent general condition the fever persisted at lower levels till December 16, when the wound became painful and swollen and a residual abscess was evacuated. From then on convalescence was rapid and uninterrupted, and the patient was discharged to a convalescent home on January 14 in good condition and with the wound healed.

A. G. BANKS, F.R.C.S.Ed.,
Honorary Surgeon.
C. JOSEPH, M.R.C.S., L.R.C.P.,
House-surgeon.
East Suffolk and Ipswich Hospital.

Subarachnoid Haemorrhage in a Child Aged 3

The following account is of interest because of the rarity of reported cases of subarachnoid haemorrhage in young children.

CASE RECORD

A child aged 3 years 4 months was admitted to hospital on March 11 in a state of coma. The history given by her doctor was as follows: That morning the child had been quite well and was playing with some other children, when she suddenly complained of violent headache, which seemed to be mainly left-sided; she then collapsed. Ten minutes later she vomited. This happened at 9.45 a.m. At 11 a.m. the doctor saw her and arranged for her admission to hospital.

On admission at 12.30 p.m. the child was comatose, but could be roused slightly. The lips were cyanosed and the face pale. The pulse was 64, bounding in character, the temperature 97° F., and the respirations 22, shallow and sighing in character. The examination of the nervous system revealed the following findings: neck rigidity +; Kernig's sign positive; pupils small, equal, and reacted to light; tendon reflexes brisk; abdominal reflexes not obtained; plantar response extensor on both sides.

At 1.30 p.m. a lumbar puncture was performed. The cerebrospinal fluid was not under pressure, but was definitely blood-stained. On standing, the blood did not clot and the supernatant plasma was tinged yellow. A tentative diagnosis of subarachnoid haemorrhage was made. The coma deepened, and shortly before 4 p.m. the pulse rate increased to 126 and the temperature began to rise. The child died at 4 p.m., the temperature then being 106° F.

Post-mortem Examination.—The upper surface of the cerebral hemisphere was normal. On removing the brain from the cranial cavity a diffuse area of haemorrhage covering the under surface of the cerebellum and cerebral hemispheres was found. The maximum concentration of blood was situated in the vicinity of the bifurcation of the basilar artery, where a large clot was present. This seemed to be the origin of the haemorrhage. In spite of a meticulous search no trace of aneurysm was found. The rest of the examination revealed nothing.

We are indebted to Dr. Lucy Parker for permitting us to report this case, and to Dr. Elford Piney, who conducted the post-mortem examination.

ROBERT CRAWFORD, B.A., M.R.C.S., L.R.C.P.,
ANDREW ZINOVIEFF, M.R.C.S., L.R.C.P.,
House-physicians, Harrow and Wealdstone Hospital.

F. D. Murphy, H. D. James, and J. W. Rastetter (*Amer. J. med. Sci.*, 1940, **199**, 328) record twenty-three cases of trichinosis admitted to the Milwaukee County Hospital between January 1, 1931, and January 1, 1939. Their ages ranged from 17 to 57, but only two were 50 years old or over. Twelve were males and eleven females. Occupation had no importance. One patient developed thrombophlebitis of the left femoral vein. Two died and twenty-one recovered completely.

Reviews

EFFORT SYNDROME

The Soldier's Heart and the Effort Syndrome. By Sir Thomas Lewis, C.B.E., F.R.S., M.D., D.Sc., LL.D. Second edition. (Pp. 103. 8s. 6d. post free.) London: Shaw and Sons, Ltd. 1940.

Effort syndrome is the term applied to a group of symptoms brought out by physical effort, but also present at rest, and although it is quite common in civil practice it is especially apt to develop, in those predisposed, under the conditions of war service. The term "soldier's heart" has therefore been used, but the effort syndrome must be sharply distinguished from the symptoms of heart disease.

A second edition of Sir Thomas Lewis's book *The Soldier's Heart and the Effort Syndrome* has now been published, and the information which it gives on the diagnosis and treatment of this condition should be known and carefully followed by the medical officers of recruiting boards and also those in the Services. The chief symptoms are shortness of breath, exhaustion, palpitation, left mammary pain, faintness, and giddiness. So far as the aetiology is known many factors are concerned, often more than one in the individual case. These factors are a poor physical and nervous constitution, the presence of an infection, or the after-effects of an acute infection. When one or more of these exists, physical and mental strain will tend to produce effort syndrome. In the 1914–18 war there was great waste of time, money, and men through inability to recognize and to treat this condition properly. Thus Lewis states that 70,000 were classed as cardiovascular disease, and about 40,000 became pensioners. The first step in dealing with the problem must be taken at the first medical board, when many cases can be recognized by proper examination, from the history, and by exercise tests, and as a result rejected or properly graded. In the second place, correct diagnosis and treatment of those developing symptoms under training are necessary. Treatment, which is not easy and calls for graduated exercise, psychotherapy, and sometimes firmness, may be perhaps best given at special centres.

If the costly mistakes of the last war are not to be repeated, all medical officers dealing with recruits and in the Services should become familiar with the effort syndrome, and for this purpose a study of Lewis's book on the subject is essential.

ENCYCLOPAEDIA OF MEDICAL PRACTICE

The British Encyclopaedia of Medical Practice, including Medicine, Surgery, Obstetrics, Gynaecology, and other Special Subjects. Under the General Editorship of Sir Humphry Rolleston, Bt., G.C.V.O., M.D. I. *Cumulative Supplement* (pp. 170); II. *Surveys and Abstracts* (pp. 606). Cost to subscribers to the *Encyclopaedia* of the entire supplementary system, containing Cumulative Supplement and Surveys and Abstracts volume, is 25s., plus postage, while the cost of the Surveys and Abstracts volume, sold by itself to those who have not yet subscribed to the *Encyclopaedia*, is also 25s., plus postage. London: Butterworth and Co.

The two supplementary volumes of the *British Encyclopaedia of Medical Practice* published since the completion of the work have different objects and will have a different appeal. There is to be an annual Cumulative Supplement which it is projected should bring up to date the articles in the main body of the *Encyclopaedia*, often by the authors who wrote the original ones but under the general supervision and control of the editors. By key numbers and page references it is possible to supplement the originals with recent and up-to-date information, and it is proposed that this Supplement should be replaced annually, so that many cross-references may be avoided. The present volume, representing the Supplement for 1939, thus is to be read in conjunction with the corresponding articles in the original work. The arrangement of the material is alphabetical. There will be, it is hoped, a fuller index, not only of headings and articles, but of detail as well. Such an index may be difficult to devise and may occupy much space, but it is likely to prove a great help in tracking down information which at present is difficult to find.

The other volume, consisting of surveys of modern aspects of medicine and its branches by leaders of the profession in their special subjects and of abstracts of recent medical literature, is likely to be very useful and to appeal not only to subscribers to the whole *Encyclopaedia* but to others who require an up-to-date review. The first 160 pages thus present the present position of medical and surgical practice. Then follows a review of modern drugs and of the uses of the sulphonamide group, and the remainder of the book is filled with summaries of medical journals published in many parts of the world. These are readable and well digested, so that most recent information is available.

DIGESTIVE DISEASES

Diseases of the Digestive System. A Textbook for Students and Practitioners. By Eugene Rosenthal, M.D. With a preface by R. J. V. Pulvertaft, M.D., F.R.C.P. (Pp. 394; 234 illustrations, including 104 in colour. 42s. net.) London: Henry Kimpton. 1940.

The columns of medical journals bear frequent witness to the heart-searchings that are prevalent concerning methods of clinical teaching. In a subject such as medicine, which itself is always changing, this is not only inevitable but commendable. Dr. Eugene Rosenthal is a strong believer in the efficacy of the visual memory. It would generally be agreed that in clinical work what we see forms a more lasting mental image than what we read, and it has been urged that the present examination system lays too much stress on the latter, so that students tend to neglect the wards for the library. Although some psychologists are rather contemptuous of the visual type of memory, it is certainly a convenient possession for the clinician, who, as his experience increases, finds himself, as it were, in the possession of superposed mental photographic records. Dr. Rosenthal in his book on *Diseases of the Digestive System* attempts to take full advantage of visual impressions by a large series of coloured diagrams and texts (some rather reminiscent of advertisement hoardings) as well as *x*-ray photographs and more conventional illustrations. He claims in this way that mental association is stimulated. There is doubtless a good deal to be said in favour of this method, especially when reinforced by the visual impressions gained from museum specimens. Dr. Pulvertaft, who contributes a brief preface in support of the methods here enjoined, reminds us of the vivid and incisive representations of pathological material in the Wellcome Museum, on a plan which might well be imitated elsewhere and which, indeed, is being put into effect at the Kitchener School of Medicine in Khartum.

It might justifiably be wondered whether such a visual form of mnemonics sufficiently inculcates habits of thought, and the danger of the method in inadequate hands is admitted. However, the teacher with a gift for essentials, and (equally important) with the artist's gift of elimination and emphasis, can no doubt use it to good effect. Nor should it be understood that this book merely consists of illustrations and diagrams. Many vexed questions are lucidly discussed. We may take as an instance the section on gall-stones. Here Naunyn's theory of their origin from stagnation in an infected gall-bladder is first stated, and the evidence for infection is critically considered and dismissed. Then Aschoff's views on mechanical causes such as tight lacing and pregnancy are given, with his attempted explanation of the presence of pure cholesterol stones in the neck of the gall-bladder. This leads the author to discuss Chauffard's theory of hypercholesterolaemia as the main cause, which he finds inadequate. Finally he leans to Rovsing's view that the essential factor is the intrahepatic formation of minute granules of bilihumin (bile pigment and lime salts), which passing down into the gall-bladder act as the core on which larger concretions are deposited. This seems to us merely to push the explanation a stage further back and to leave the problem unsolved. Indeed, the author has to take refuge in a "gall-stone diathesis." Diathesis now has a much more scientific connotation than formerly, and it is rather unsatisfactory to revert to its former unprecise usage. Nevertheless the student will find this and other discussions stimulating. We should, however, not like to treat a case of acute gastritis by apomorphine, as recommended on page 51.

URETERIC CALCULI

Les Calculs de l'Urétère. By Pierre Macquet. With preface by Professor G. Potel. (Pp. 190; 22 figures. 45 francs.) Paris: Masson et Cie. 1939.

The author gives a clear and simple account of the physical, chemical, clinical, and radiological characteristics of ureteric calculi, and also of their diagnosis and treatment. The stones are pelvic in 75 per cent. of cases, solitary in 90 per cent., rarely bilateral (3 or 4 per cent.), and radiologically visible in at least 90 per cent. They occur with equal frequency on the right and left side and in men and women, but are rare in children. The history averages two to three years in duration. The lumbo-iliac stones are often globular in shape, whereas those in the pelvis are nearly all elongated.

Because of the possibility of the upward migration of a ureteric calculus during operation in the Trendelenburg posture, the author recommends that one *x*-ray film should always be taken in that position, and (perhaps more important) that radiographic examination should immediately precede operation. The danger of infection from an indwelling ureteric catheter is emphasized; indeed, apart from calculous anuria, the following limited indications for its use are given: a small pelvic stone, ability to pass the catheter beyond it, and absence of superior dilatation. Especially with high calculi, the need is for ureterolithotomy, not endoscopic methods; and when these fail it is dangerous to repeat them. The author considers suture unnecessary after ureterolithotomy, unless the ureteric walls are very thickened, and prefers not to institute drainage, because of the risk of secondary iliac haemorrhage. Such risk, however, is absent with the median approach, which, curiously, is not mentioned.

This is a sound book, based on personal experience. The illustrations are excellent, and there is a good bibliography.

FACT AND FANCY IN THE SUDAN

Land of the Blue Veil. By Allan Worsley, M.B., Ch.B. (Pp. 257; 12 photographs. 10s. 6d. net.) Birmingham: Cornish Brothers. 1940.

Pilate Pasha. By Michael Fausset. (Pp. 377. 7s. 6d. net.) London: Jonathan Cape. 1939.

"The Sudan has lacked one thing that it can't afford to lack," says a provincial governor in one of Dr. Worsley's sketches—"a Kipling to immortalize it before it is too late." No one who has had anything to do with the Sudan will disagree. Unfortunately, Kiplings are not common, and very few writers have done for another country what Kipling did for India. Until "Michael Fausset's" book, the Sudan lacked a novelist of any kind. There is a fair amount of literature about the conquest of the Sudan, and of didactic and descriptive work; it is the everyday realities of life in the country that need romantic record. During many years in the Church Missionary Society's hospital at Omdurman Dr. Worsley worked hard and faithfully to understand the people who came to him for treatment. *Land of the Blue Veil* gives evidence of how well he succeeded. He is obviously himself very much of a human being, and he has explored deeply into the humanity of the Sudan natives. His opportunity was good, for Omdurman—though not quite so cut off from civilization as the publisher's notice suggests—is a genuinely native city and fairly representative of nearly every part of the country. Dr. Worsley is not a Kipling, but is a capable observer, and has been able in a simple and vivid manner to convey a surprising amount of that atmosphere which can only be conveyed by indirect association. Some of his sketches are largely fictional, others are photographic, and all are thoroughly authentic. There is no sham Oriental nonsense here; these are real people living real lives in a simple and somewhat stark environment, of which heat, dust, insects, and strong smells are the principal ingredients. Magic and religion naturally play a large part in the book, as they must in any work about a Muslim country, and Dr. Worsley's description of the Sufi *zikr*—the Dervish religious dance—must be one of the best pieces of work on the subject that has been done. No one interested in the Sudan should miss this book.

"Michael Fausset" set himself a different task. He was obviously for several years a member of the Sudan Medical Service, who loved the country and kept his eyes well open to observe the habits both of the people and of the sprinkling of highly competent English officials who administer them. He has written, *con amore*, a novel about the intimate everyday details of the life of a Sudanese official—his nights spent on a native bedstead on the flat roof of his house under a mosquito net, his morning tea, his ride round the town, his office work in the heat of the day among a chatter of native officials, police, villagers, and desert Arabs, his polo and tennis, his gathering for drinks after sunset on the veranda of one or other of his friends, his trips in river steamers and on camels, and the hundred other components of that little-known but fascinating existence. For doing this he has deserved and will receive the gratitude of every reader who has lived that life and regretted that it has never found its own poet. The device was ingenious: to make his "Bahr el Gamus" Province a composite picture of northern desert and southern swamp, of western mountains and eastern forest, of Arab and pagan; and it can hardly have been by chance that the name of his capital, El Iswid (black), is the singular form of the word "Sudan." Everyone who has worked in the country will recognize something familiar.

It was a little strange, however, that the author should govern his province with seconded military officers and only one young civilian official. Surely the political service penetrated into the remotest corner of the Sudan years ago.

Having produced a competent and appealing picture of real things, it was a thousand pities to go and spoil it by introducing this improbable and inconsequent Pilate theme. The Anglo-Egyptian Sudan certainly looks extremely like an animated illustration to a children's Bible, and it is almost impossible to go there without the feeling of having suddenly stepped into the pages of one of the Gospels. The inhabitants are docile but subject to recurrent attacks of religious fanaticism. The political officer dealing with troublesome religious leaders can hardly escape comparing his position with that of Pontius Pilate. He may sympathize with the prisoner, but he cannot allow riot and sedition. "Michael Fausset" draws his province governor as an enlightened and cultured officer faced with the identical situation which faced Pilate. An exceptional "fiki" (holy man) has been acquiring a following and infuriating the orthodox Muslims by his doctrines of freedom and iconoclasm. He is called, of course, "Isa bin Yusuf," and the names of his relatives and followers are faithfully transliterated from the New Testament. At the climax of the story he is brought by a threatening mob before the governor, who, like Pilate, orders his death. Needless to say, no real governor would commit so illegal and cowardly an act, and the author would have done far better to choose a human plot instead of involving himself in the contradictions of this archetypal one.

Notes on Books

The understanding by the British medical profession of psychology and psychiatry is handicapped by a tendency to cling to the belief that a comprehension of the whole organism will somehow be gained through a study of its different parts. Psychiatrists, however, are beginning to lay stress on the need for comprehending the patient as a human being, a member of society. This movement was greatly assisted by the psychiatric liaison department at the Colorado General Hospital, and the workers there developed the science of what is termed psychobiology—the science of understanding how and why the integrated person works together to produce a live man, possessing complicated relationships with his environment. *A Handbook of Elementary Psychobiology and Psychiatry*, by Dr. EDWARD G. BILLINGS, is published by the Macmillan Company at 10s. Within the compass of a volume which will slip into the pocket the author has dealt concisely and adequately with psychobiology, procedure in psychiatric examination, and general psychopathology. Each section has a useful bibliography. It is difficult to imagine a more useful guide for the general practitioner into the mazes of modern psychiatry.

Physique and Nutrition. A Study of European School Children in Pretoria, Union of South Africa, by HARDING LE RICHE, is issued by the S.A. Council for Educational and Social Research as No. 13 in the Research Series. This monograph deals with an elaborate survey of European children in Pretoria. The object was to attempt a correlation between certain measurements of physique with studies of food intake. The results obtained are summarized in forty "recommendations and findings" which will be of value to others not only for the positive results set out but also for a frank exposition of the many difficulties and inconsistencies encountered. Copies are obtainable from J. L. Van Schaik, Ltd., Booksellers and Publishers, Pretoria.

Preparations and Appliances

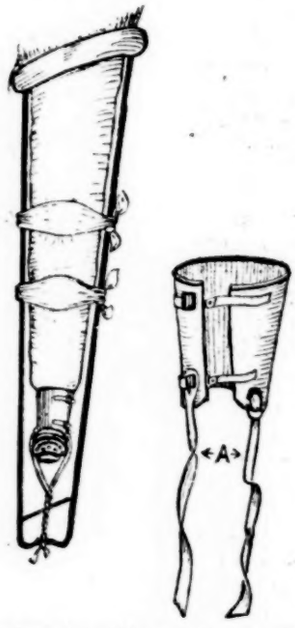
THE THOMAS SPLINT IN THE FIELD

Major R. ST. JOHN LYBURN, M.D., R.A.M.C., writes:

Various methods have recently appeared in the *Journal* for the application of extension when using Thomas's leg splint. In the issue of April 13 (p. 633) Dr. R. M. Greig recommends the use of a canvas spat. It occurred to me that web anklets—now part of the active service clothing for soldiers and airmen—being part of the battle dress, could be substituted for the canvas spat.

Two pieces of bandage are inserted into the lower end of the anklet. This may be done on the outer side of the anklet by tying the piece to the lower strap of the anklet. A hole is made (effected by rifle bayonet) in a corresponding position on the inner side of the gaiter. An alternative is to make two holes through the canvas of the anklet on either side just above the thickened lower rim. The free ends are brought down and fixed to the notch of the splint in the ordinary way. In this manner adequate extension may be applied.

The advantage of this simple method is the availability of the articles required—both gaiter and bandage (first field dressing or rifle sling) being on the person of the disabled man.



Diagrams showing the anklet method of counter-extension. The twin tapes (A) can be made up from the patient's own first field dressing. One is fastened to the buckle on the anklet and the other to a hole made in the anklet.

The method of immobilizing the fractured leg and of applying extension described in the *Journal* of January 6 (p. 25) by Dr. F. B. Chavasse, for use when Thomas's splint is either not available or conditions make it too dangerous for the bearers to apply, works admirably. We were unable to apply the lower sling in the method described by him, as the 1937 pattern sling differs somewhat from that in use in the last war. The following method, however, works well. Open the sling to its maximum. Put the looped end over left handle of stretcher. The free end is then brought over the left instep and round behind the left ankle across the front of the ankles of both feet. It is now brought round the outer side of the right ankle—behind it and across the right instep and round the outside of the right handle and fastened to the end of the sling by the buckle. Some lateral rotation of the injured limb takes place, but this may easily be overcome by a bandage round the feet and thus binding them together vertically.

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BLACK-OUT IN INTELLECTUAL EUROPE

The mounting catastrophe in Europe has seriously embarrassed the work of the Rockefeller Foundation. When war broke out last September the Foundation had 110 appropriations distributed in twenty-two European countries; the sum which was being expended was a little under one million pounds, about one-half of which was for work in Great Britain. In a number of instances it has been possible to maintain the assisted work with only indirect disturbance. At the Tavistock Clinic in London, for example, the research on psychosomatic medicine which the Foundation is financing has proceeded without serious interruption. The *Review of the Foundation*, which was published before Germany invaded Scandinavia and the Low Countries, also speaks of assisted work on neurology in the Universities of Oxford, Brussels, Leyden, Oslo, and Lund. To-day only the first and last of these universities are not in alien occupation. At the beginning of the war the University of Warsaw ceased to exist; the Polish faculties of the Universities of Cracow and Vilna were imprisoned or dismissed; the University of Strasbourg was torn from its site and transferred to Central France; the student population of the University of Paris shrank to one-quarter of its usual numbers; more than half the universities of Germany were closed, and the institutions comprising the University of London were scattered over England. In all countries, combatant or non-combatant, the demands of the military situation have decimated faculties and student bodies alike, and laboratories have been geared to the war machine.

It is true that there has been some effort to insulate important scientific research work from the shock of war, and to allow laboratory men to continue at their tasks. In this respect Europe has learned a lesson from the last war, when a heavy toll was taken of promising young scientists, and when half the 240 enlisted students of the Ecole Normale Supérieure in Paris, which supplies the French universities with professors, were killed, as well as more than one-fifth of the mobilized graduates of the school who already held university chairs. But even this effort to keep scientific workers at their benches solves only a part of the problem, for who can say what gifted minds, what undiscovered genius, what "hands that the rod of empire might have swayed," but giving as yet no obvious sign of special aptitude or skill, are drafted into the combatant ranks? Not in army recruiting offices or medical boards or, indeed, anywhere else is there sufficient imagination to detect the coming Darwin or Pasteur. John Hunter, then just becoming of military age, might have been taken to fight, and fall, in the Scots rebellion at Culloden, just as Lister might have perished in the Crimea, or Roentgen in the Franco-Prussian War. So it is with sadness that one reads that 154 Fellowships of the Foundation, which were awarded, of course, to the relatively young, had been terminated on account of the war by the end of 1939.

In this hour of European black-out it is at least cheering to read in the Rockefeller review a tribute to the leadership of Europe in the intellectual field. It is often said that in some subjects—neurosurgery, dentistry, perhaps orthopaedics, are quoted as examples—the leadership has passed to America. But Dr. Raymond Fosdick, the president of the Foundation, acknowledges that in physiology, anatomy, and pathology it would be difficult to determine whether the leadership lies in Europe or in the United States; and in pharmacology, therapeutics, tropical diseases, ophthalmology, dermatology, forensic medicine, and social medicine the leadership is unquestionably still in Europe. Along a different line, nowhere else in the world can the Scandinavian group which is focusing so many precise techniques of chemistry and physics on problems of biology be duplicated or even approached. America needs to be humble, says this American, about the question of intellectual leadership. Of the six Nobel prizes awarded in science in 1939 five went to Europe and only one to the United States. "In countless ways we are dependent upon Europe for stimulation and leadership in relation to many segments of our intellectual and cultural activity."

If, because of war exhaustion or chaos, the universities and laboratories of Europe should be forced to suspend their fundamental activities, even for half a decade, the consequences to the intellectual life of America will be alarming. For all scientific advance is the product of cross-fertilization in widely separated parts of the world, taking no account of frontiers or nationalities, indebted alike to Gentile and Jew, bond and free. Recent chemotherapy, the work which has led to the production of the substances of the sulphonamide group, is mentioned as an example. The first hint of it came from Germany, where the drug was given the name of prontosil. It was taken up by the Pasteur Institute in Paris. Queen Charlotte's Hospital in London then made its contribution, and the Johns Hopkins School of Medicine carried forward the experiments. In things of the intellect as well as of the spirit we are members one of another. If Europe freezes up it will be difficult to keep the fires burning anywhere else.

VOLTAGE IN X-RAY THERAPY

Radiotherapists still disagree about the merits of the different types of radiation used in the treatment of cancer. The good results obtained from the local application of the very short wave radiation of radium and the noticeable improvement in the results when treating deep-seated cancer with *x* rays when the voltage was raised from 160 to 200–220 kilovolts, thereby shortening the wave-length of the radiation,

have led many radiotherapists to believe that there is a specific virtue in short-wave radiation which the longer-wave radiation produced at lower voltages apparently does not possess. However, the excellent results of treating superficial cancer with contact *x*-ray therapy, where the working voltage is only 50 to 60 kilovolts, seem to indicate that the good results obtained from radium applied locally are due not to the character of the radiation but to the method of its application. It does not seem to matter whether the radiation is produced by *x* rays at 50 kilovolts or by radium at an equivalent of several million volts; what matters is the way in which the radiation is administered. When radium is applied locally, or when the *x*-ray target of the tube is brought close to the lesion, as in contact *x*-ray therapy, the maximum effect of the radiation is spent in the superficial layers of the tissues, while the deeper structures remain relatively unaffected. They are therefore able to keep up their defensive function and oppose an effective barrier to the spread of the cancer. Consequent on the excellent results obtained from contact *x*-ray therapy, radium has lost much of its glory, while at the same time the belief in the specific effect of short-wave radiation on cancer has been much shaken.

There nevertheless remains the fact that with the increase of the working voltage from 160–170 to 200–220 kilovolts the therapeutic results have improved. In the light of the above it seems improbable that the improved results were due to the shorter wave-length of the more penetrating radiation produced at 200–220 kilovolts. The better results could be explained by the larger and consequently more adequate doses of *x* rays which reach a deep-lying lesion when a more penetrating radiation is used. A sufficient dose of radiation could therefore be applied to the deep-lying tumour itself without serious damage to the superficial normal structures. It was natural to assume that better results could be obtained from a still more penetrating radiation. Hence the introduction of ultra-deep or supervoltage *x*-ray therapy, at voltages of 350, 500, and, lastly, 1,000 kilovolts. According to Lauritsen,[1] however, there is little to be gained from voltages above 400 kilovolts. He found that there is a definite improvement in the dose which reaches a depth of 10 centimetres when the voltage is raised from 100 to 200 kilovolts, but that there is no further increase of the depth dose when the voltage is raised from 200 to 500 kilovolts if ports of entry larger than 10 × 10 centimetres are used, while the dose at 5 centimetres suffers an actual decrease. He therefore concludes that, so far as depth dose is concerned, there is no advantage in going to tube voltages higher than 400 kilovolts unless it is possible to reach voltages much higher than 1,000 kilovolts, which is hardly probable, at least in the near future. Lauritsen's conclusions are of great practical importance. A number of radiotherapists feared that they were not getting the best results from radiotherapy for lack of the more penetrating radiation, produced at voltages of 500 kilovolts or even higher, which some of their more fortunate colleagues were able to persuade their hospitals to install at a very great expense. They are now assured that standard deep *x*-ray therapy plants are adequate for their purpose and that there is little to be gained from voltages above 400 kilovolts.

[1] *Amer. J. Roentgenol.*, 1939, **41**, 1003.

A CLEARING-HOUSE FOR THE STUDY OF CONSTITUTION

Rather more than three years ago we published a letter from Professor R. Ruggles Gates, F.R.S., chairman of the Bureau of Human Heredity (115, Gower Street, London, W.C.), commending to the notice of medical men the information service offered by that body to research workers in human genetics. Particulars have now reached us which throw light on the work accomplished by this clearing-house in the four years of its existence, on its special contribution to wartime problems, and on the tasks that await it in the future. The collection of books and reprints, etc., stands now at over 3,000 works in addition to an authors' index of wider extent. A system of indexing by cross-reference, running into many thousand cards, makes it easy to turn up any point as wanted in the whole collection. Specialist inquirers can be quickly supplied with relevant bibliographical items.

Routine work at the Bureau has shown a need for two undertakings which seem too important to be deferred by war. One is the complete collection and analysis of all material so far appearing on genetics in relation to cancer. Cancer research has now reached a stage at which this aspect demands to be taken into account. In tuberculosis also a comparable survey is wanted. In view of the obvious importance of both, these two surveys have been begun. Several other similar studies call for attention, among which problems bearing on war come first. Night blindness as a genetical question can be taken early. The current literature on wartime medicine suggests the importance of bringing together the results of research already carried out on the following questions: (1) rheumatism in its relation to low-temperature allergic reaction; (2) allergic and anaphylactic conditions in connexion with protective inoculation of members of the Forces; (3) constitutional idiosyncrasies in regard to anaesthetics and to certain drugs such as the sulphonamides; (4) neuroses and nervous breakdowns under war strain; (5) physiological constitution in the choice of air pilots; (6) constitutional factors in wound therapy; (7) types of individual reaction to infective diseases, and variations in immunity. Here, then, are diverse fields awaiting survey. At this moment the Bureau suggests that time put in there, studying the files that especially interest them, might be productive of some good little excursions into one or other of these fields for inquiry. War conditions, be it noted, far from preventing such work, really make it easier, and the result of close and concentrated attention might clarify problems which have hitherto baffled war medicine.

The system adopted in indexing at the Bureau of Human Heredity has had to take into account many

different aspects of genetics, as well as dealing with many different languages. This has automatically brought into being a comparative definition of terms as used variously by different schools and individual workers. The detailed work already undertaken gives now a series of over 7,000 terms occurring in genetical literature, arranged in a synonym index with their equivalents; this index should serve as the basis for a lexicon of genetical terminology. Another useful by-product of the collation emerges from the subject files, which form the skeleton of the cross-reference index. English equivalents have now been provided as near as may be for all the terms in current use, and it is proposed to publish them in the near future; medical men and others will then see almost at a glance which of the points touching their own studies can be readily surveyed at the Bureau. Bibliographical references are offered and the files may be consulted by those wishing to look up data. Those whose research is too immediately urgent to be abandoned in wartime will find useful the Bulletin issued to research workers (in three languages); analysis of the material collected discloses where the major gaps occur in many problems; and a question addressed to the Bureau may save overlapping or the repetition of a course over an unfruitful field.

UNIVERSITY HEALTH SERVICES

Students' health services have now been established for some years in a considerable number of Canadian and American universities, and in a few in Great Britain. The degree to which they have been successful has varied a good deal, but they ought to make a particular appeal to the medical schools. Their main functions have been to assess the physical fitness of students, and to provide medical and surgical advice and treatment for such students as may need this. The conception of their value and purpose has widened of late, so that it is not merely physical fitness which they are engaged in determining but health in all its aspects. This involves two extensions of idea: first, that health is a positive state which can be measured and improved; and, secondly, that it involves an assessment of mental ability, emotional response, and personality, as well as bodily structure and function. In the most effective services, especially in North America, a decision as to the degree of capacity to undertake the physical, intellectual, and social activities of a university student is aimed at. This is all to the good, and in a medical school may do much to create a correct attitude of the whole student body towards the meaning of health and fitness as the main object of their study. In a suggestive article by Dr. E. Stanley Ryerson, assistant dean of the Faculty of Medicine of the University of Toronto, reprinted from the *Journal of the Association of American Medical Colleges* for March last, and entitled "Human Health and its Assessibility," the author envisages an even greater usefulness as within the scope of a university health service. The health education of the whole student body should be a responsibility of such a service, and it should assume a definite place in the medical curriculum. The clientele of the service presumably consists of healthy persons, and it could easily and profitably be organized for various purposes in relation to the curriculum in view of the increased emphasis now placed by the Resolutions of the General Medical Council on the preventive aspects of medicine being kept prominent throughout the whole period of study, and on the importance of psychology, both in the early and in the clinical years of the course. Such usage is particularly indicated in teaching (1) the anatomy of the living subject; (2) the technical methods of making a full physical and psychological investigation; (3) personal or individual hygiene; (4) a sense of communal responsibility for health and well-being and of what the community should provide in that direction. Of course all these things are taught in one part or another of the curriculum in every medical school, though not all of them in the best way or with sufficient emphasis. The point effectively urged by Dr. Ryerson is that medical students enrolled as a body in a specific health service should be organized and utilized for collective training in the assessment, preservation, and promotion of health, and as material for mutual practical examination, and not merely for the determining of the physical fitness of the individual student and for the provision of attention should he become injured or ill. The author suggests also that there should be an opportunity in such a service for the prosecution of research in problems of health of persons of the student age period. Dr. Ryerson has certainly put forth in his reprinted article an interesting and powerful plea for the establishment of university health services where they do not already exist, and for their wider use in the whole scheme of medical education.

THE PATHOGENESIS OF ROSACEA

Ever since the time when clinical observation made it obvious that over-indulgence in alcohol was far from being the sole, and probably not even the chief, cause of rosacea there has been much speculation about its pathogenesis. Strong tea (with its resulting dyspepsia) was a natural successor to alcohol, and another obvious aetiological transition was from the stomach to the pelvis. Klaber and Wittkower[1] have tackled the subject afresh in a careful study of some fifty cases. They start from the position that the primary feature of rosacea, the venous congestion of the face, can reasonably be regarded as a permanent "blush" or "flush." It is not very easy to draw a distinction between these two terms, for both are transient phenomena. But "blushing" implies an associated sensation of shame or guilt, while "flushing" is usually (for example, as seen during the menopause) free from emotional accompaniment. If dependent on emotion at all it is a sign of anger. Klaber and Wittkower made a careful inquiry into the factors aggravating the eruption, the flushing, and the general health, especially the state of their patients' digestion. Few had any signs or symptoms of abdominal or pelvic disease. On being questioned most of them said that the condition became worse if they were hot, hurried, or worried. Hardly any laid the blame on indigestion, alcohol, or tea. Heat and worry were the predominant aggravating agents, and many of the patients could not decide which was worse. Later they were subjected to a detailed psychological investigation. It is not easy to give a summary of the interesting results thus obtained, but there appears to be little doubt of the importance of the emotional factor in rosacea; almost all the patients stated that excitement and worry brought on hot flushes and that their condition varied with the ebb and flow of their external circumstances. In a large proportion of

[1] *Brit. J. Derm. Syph.*, 1939, **51**, 501.

the cases there was a history of acute psychological trauma immediately before the onset of the disease. A further series had suffered from prolonged preceding social or sexual stress. The type of personality revealed as a rule was one of hypersensitiveness. Anxious dependence on the good will of others and a constant fear of attracting attention suggested the existence of strong feelings of inferiority, guilt, and shame—in fact, exactly the emotions calculated to cause frequent and intense blushing, thus leading to the congestion of the face which is the basic symptom of rosacea. The work of Klaber and Wittkower on rosacea runs parallel with that of Wingate Todd and his collaborators on the effects of anxiety in diminishing gastric tone and in inhibiting peristalsis. Hence recent workers have taken the view that when the stomach "causes" rosacea it is through motor disturbance rather than through secretory irregularity. Possibly, however, the more correct view is not that the rosacea is caused by the stomach disturbances at all but that both are simultaneously brought about by psychological disorder.

MENTAL CONFUSION IN CRIME

The law, in more or less degree in different countries, has taken the psychiatrist into its counsels with diminishing reluctance during recent years. The medical and the legal mind come together with diffidence and a certain amount of distrust. Doctors and lawyers, however, agree about one thing—the importance of case law. The objective study of criminal cases in which psychological abnormalities are evident will do much to enlarge the field of medico-legal co-operation. We may instance three recently described by Leroy and Masquin[1] in France of homicidal violence (with a fatal outcome in two instances) in which there was amnesia, more or less complete, for the crime itself and for the associated events. The important question of responsibility, and of the true nature of the amnesia, is most readily resolved in the second of the three cases, in which the murderer was clearly suffering from a hallucinatory paranoid state in which he mistook the victim for a Russian spy. All these cases were characterized by a lack of discoverable motive, and in each there was plenty of eye-witnesses' evidence of abnormal behaviour on the part of the accused. It cannot be said, therefore, that the cases presented any great medico-legal difficulty, but they illustrate several important medico-legal points. All three men had a history of temperamental instability, leading to frequent changes of occupation and lack of success in life. They belonged, in fact, to the large miscellaneous group of psychopathic personalities the significance and even the nature of which are insufficiently recognized by legal authorities. In crime committed by such people it is unfortunately not often that such definite evidence of abnormality close to the time of the criminal act is obtained from eye-witnesses. In states of dissociation more total than in these instances there may be no recognizable abnormality in external behaviour even to the educated eye. Such cases as these here recorded are of value in showing in an unmistakable way that there are in fact, what the law tends to deny, degrees of responsibility, and that it is possible to have degrees of lack of integration of mental function exhibited in rapid succession in the same individual, with preservation of rational behaviour for routine activities such as those involved in a journey from one town to another. Case 1 shows a progression from a state of depression through one of erotic adventure to aimless wandering and increasing incoherence of conversation, accompanied almost certainly by diminished perception of the environment, this accounting largely for the amnesia afterwards. It is impossible to deny that he was less responsible in the last phase than in the beginning; yet all the phases were clearly part of the same mental illness. In the final phase even the legal criterion that he had not known what he was doing would probably have been satisfied; in the earlier phases this criterion would not have allowed him to escape capital punishment; yet he was mentally ill in all the phases, as subsequent developments amply showed. Another obvious lesson is that in estimating responsibility account must be taken of the whole history of the illness and indeed of the criminal, and not simply of his state of apperception, or knowledge of right and wrong, at the moment of the crime. Attention is drawn by the authors to the nature of the amnesia in these men; it is characterized by two main features: (1) the presence of patches of memory; and (2) consistency in recollection—it was always the same patches that recurred in subsequent questionings. It is remarked in one case that the memory images were purely motor; the criminal remembered his hand pulling the trigger but not the sound of the shot. The prominence of sensory images is probably characteristic of such states of amnesia, and distinguishes them from malingered amnesia. The fragments of memory that the malingerer allows to appear are apt to be descriptions of events—that is, conceptual recollections—rather than memory pictures at the sensational or, at most, the perceptual level.

[1] *Encéphale*, 1939, **1**, No. 4, 169.

TOXICOLOGICAL ASPECTS OF THE TRADE IN DRUGS OF ADDICTION

Egypt has suffered more severely from drugs of addiction than any other country with the exception of China. The late Mr. Frank Bamford, formerly director of the Medico-Legal Laboratory of Cairo, has given an interesting account[1] of some medico-legal aspects of the fight against this scourge. The range of his experience is indicated by the fact that in 1929 his laboratory tested 17,000 drug samples; in 2,000 cases no drugs of addiction were found, heroin was present in 10,000 samples, and the remainder consisted mainly of hashish and opium. During 1929 it was discovered that many of the samples analysed were not really heroin (diacetylmorphine) but either acetyl propionyl morphine or dipropionyl morphine. The reason for this was that the manufacturers had discovered a loophole in the law which permitted the uncontrolled production of the latter substances, although they are just as harmful as heroin. This loophole was quickly stopped, largely owing to the information provided by the Cairo laboratory. The incident illustrates the new dangers that arise when a nefarious trade commands enough capital to obtain the services of skilled chemists. The analyses showed that the packets of drugs sold usually contained less than 20 per cent. of heroin. The price was about 2s. per packet of 0.1 gramme. This works out at about £5,000 per kg. of pure heroin. The cost at the factory was from £40 to £1,000 per kg., and hence the profits were enormous. Fortunately the untiring efforts of Sir Thomas Russell have brought about

[1] *Poisons, their Isolation and Identification*. By Frank Bamford, B.Sc. With a foreword by Professor Sydney Smith, M.D. J. and A. Churchill. (18s.)

a great reduction in this trade, though in his last report[2] he says that during the war every drug trafficker is "looking forward to profits on a far vaster scale." Egypt has had a very long experience of the effects of hashish (Indian hemp), which in recent years has invaded the United States under the name of marihuana.[3] Mr. Bamford discounts the suggestion that hashish smoking is a cause of crimes of violence, because the ordinary addict is a coward and a weakling, but not, as a rule, dangerous to other people. A new danger is indicated by the statement that the rise in the price of hashish in Egypt has led to the substitution of powdered nutmeg. In large enough doses this produces symptoms similar to those of hashish intoxication, and the effects may be much more severe. This is a new example of the deplorable ingenuity displayed by mankind in the search for intoxicant drugs.

ANOXIA IN ANAESTHESIA

Since all anaesthetics cause some degree of anoxia, any experimental work on this subject is of considerable interest and importance to anaesthetists. McClure, Hartman, Schnedorf, and Schelling[4] have examined the effect in animals of various anaesthetics in reducing the utilization of oxygen by the brain *in vivo* and *in vitro* and in reducing saturation of oxygen in the arterial blood. They describe clinical cases in which serious complications are attributed to anoxia. The laboratory experiments indicate that morphine and barbiturate derivatives in particular, and also avertin (bromethol), inhibit utilization of oxygen by the brain. These drugs, therefore, produce anoxia of the histotoxic type. Nitrous oxide anaesthesia is accompanied by reduction, often severe, of the saturation of oxygen in the arterial blood, but in ethylene and cyclopropane anaesthesia this is not appreciably depressed. Investigations on ether are not reported. Out of the four clinical cases cited one patient died, without having recovered consciousness, one hour after adenoidectomy under nitrous oxide anaesthesia and premedication with morphine. In another case hemiplegia occurred in a patient recovering from appendicectomy, hysterectomy, and bilateral salpingo-oophorectomy under ether and ethylene anaesthesia after premedication with sodium amytal. The patient did not recover consciousness until nearly a month after operation, and the diagnosis was "protracted ether narcosis," to which the hemiplegia was attributed. Details of this and the other cases are inadequate for a true valuation of the course of anaesthesia. The authors condemn the barbiturates particularly, and state: "Evipal and the other barbiturates in therapeutic doses produce relatively severe anoxia by respiratory depression (anoxic type), circulatory depression (stagnant type), and reduction of cellular respiration, especially in the brain (histotoxic type). Only the elimination of the barbiturates in large pre-operative doses and as anaesthetics will prevent anoxia." Unfortunately this paper does not tell the anaesthetist how to avoid anoxia. The warning against the barbiturates in premedication and as anaesthetics takes little account of years of clinical experience in this and other countries, which has shown that, when properly employed, these drugs are safe and are of considerable value in anaesthesia. The barbiturates have rightly come to stay. That the administration of these drugs can be abused with tragic results is no argument against them, but it is pertinent to observe that those who cannot use them safely would be well advised to avoid them. The many anaesthetists who administer the barbiturates satisfactorily consider that they deserve a prominent place in modern anaesthesia. In nitrous oxide anaesthesia the reduction of arterial oxygenation is obvious, but with the more potent anaesthetics—for example, cyclopropane—the anoxia is no less anoxia for being histotoxic. If death occurs when the patient is under the influence of an anaesthetic this is no proof that the anaesthetic agent was responsible for the fatality; the whole conduct of the anaesthesia and all the features of it should be examined before a decision can be made. Anaesthetists in this country may well be surprised at this and other warnings from the United States of the incidence after anaesthesia of gross disturbances such as prolonged post-operative unconsciousness or temporary or permanent mental derangement attributed to anoxia. Such cases evidently do not occur here, and it may not be unreasonable to conclude that one explanation is that in this country the conduct of anaesthesia is undertaken only by those who are medically qualified and not by nurse-technicians, as is so frequently the practice in the United States.

[2] Central Narcotics Intelligence Bureau, Annual Report for 1939. Cairo, Government Press, Bulâq.
[3] *British Medical Journal*, December 30, 1939, p. 1282.
[4] *Ann. Surg.*, 1939, **110**, 835.

RETINITIS CENTRALIS SEROSA

Asayama in 1898 and later Japanese observers have drawn attention to a macular lesion in young and middle-aged people. One eye only is affected, the onset is acute, an artificial hypermetropia is produced owing to oedema in the macular region, and normal vision is restored after a few weeks; recurrence is frequent. In cases in which the course is prolonged whitish spots may form in the macular area; even pigment changes and haemorrhages have been observed. Generally, however, the course is mild and the prognosis good. Japanese observers, who named the condition "retinitis centralis serosa," have stressed the oedematous reaction in the central area and believe the cause is tuberculous. That the lesion is not confined to Japan, where it appears to be common, is shown by isolated case reports in European literature, one (von Graefe's) going back as far as 1866. These isolated observations in Europe have been reported under a variety of names: Guist's designation of "pre-retinal oedema" emphasizes one feature; Kraupa's label of "retinitis centralis annularis" is a topographic description; Horniker's name of "central angiospastic retinitis" implies that the cause of the complaint is a localized vascular spasm. Horniker's first studies have been extensively supplemented since 1927. He stressed the "angio-neurotic diathesis" in these cases, and could find no evidence that infection was a causative factor. Some observers—as, for instance, Streiff[1]—hold that the condition described by Japanese authors is different from that studied by Horniker, though they admit that both are not confined exclusively to either continent. In this view the condition described by the Japanese is an oedema secondary to a toxic lesion, whereas in that studied by Horniker the oedema, which is said to be more diffused, is regarded as secondary to a structural localized angiospasm, as shown by the tortuosity of the small macular vessels and by vasomotor instability. There is, of course, no reason why both toxins and angiospasm should not be able to produce similar ophthalmoscopic pictures. Yet

[1] *Klin. Mbl. Augenheilk.*, 1939, **103**, 524.

the consensus is that the two conditions are one and the same, and that Horniker's views on the underlying pathology are the more correct. This unifying conception is ably supported by Gifford and Marquardt,[2] in whose study of eight cases there was evidence of peripheral vascular disturbances. These discussions have so far centred round a fairly clear-cut clinical entity occurring in people at an age when structural vascular changes are not common. The study of this affection has, however, had repercussions in the study of macular lesions in old people. These lesions constitute a wide range, extending from ill-defined white dots and a moth-eaten appearance at the macula to massive exudate. In 1926 Morax, in reporting the first histological study of retinitis circinata, showed that the yellowish dots were defects in the retina filled with fibrin and hyaline; the walls of the retinal arterioles were greatly thickened, while the bigger vessels were unaffected. Baillart[3] and his school have recently emphasized the localized character of macular lesions and have introduced the name of "capillaritis" for a whole series of central fundus lesions, whilst Avizonis[4] has extended the conception to spasm of macular arteries in the aged as the cause of macular disturbances, and he reports improvement in vision after treatment by acetylcholine. He would go so far as to link up whitish dots at the macula as seen in old people with the retinitis centralis serosa of the young and middle-aged. Pathologically this conception may be attractive, but clinically it can only lead to confusion at present.

BIOLOGICAL EFFECTS OF NEUTRONS

Since Chadwick at the Cavendish Laboratory at Cambridge in 1932 first unwrapped the veil of mystery from neutron radiation a great deal of physical and biological experiment has been proceeding, and some of it was brought together at a special meeting of the British Institute of Radiology on May 30. Mr. John Read and Mr. L. H. Gray, who have been working on the subject at Mount Vernon Hospital, aided by a grant from the British Empire Cancer Campaign, gave an account of the production and measurement of neutrons, and Dr. F. G. Spear, who has spent a considerable time at the Berkeley University, California, investigating the original cyclotron installed there, gave a comparison of the biological effects of neutrons and gamma rays. Dr. Spear pointed out the difficulty of the biologist in dealing with a new radiation —namely, the uncertainty of dosage and the absence of comparable units. The first question tackled was whether the biological changes produced by neutrons are of the same kind qualitatively as those of *x* rays and gamma rays. For this purpose the lethal effect of neutrons on *B. coli* and the spores of *B. mesentericus* has been investigated, and the effects with all these radiations have been found to follow the same general form. The next experiment was a study of the degeneration in the retina of the young rat on exposure to radiation, and here again the same structural alterations appeared. This work suggested, however, that the neutrons were effective from the smallest doses upwards, in contrast to gamma rays and *x* rays, in which there is a latent period before the effect takes place, or at least before it becomes observable. Again, neutron efficiency is independent of the intensity with which the dose is delivered. Thus it may be said that qualitatively neutron radiation is similar to that of gamma rays and *x* rays, but quantitatively the biological effects prove certain definite differences. As Dr. Spear put it, the neutrons and the radiations now used in therapeutics are tools of similar construction, but they have differences which may enable the future worker with neutrons "to get into odd corners," and this property may be of use to the radiologist. If a radiosensitive cell is defined as one the behaviour of which is capable of being changed as a result of radiation, then the neutrons seem to be effective in some conditions in which gamma rays and *x* rays have no effect, and even though this difference be small it may prove highly useful in practice. At all events there is sufficient evidence to stimulate further intensive investigation on the biological action of neutrons on normal and malignant cells. Dr. J. C. Mottram followed with an account of the action of neutrons on the growth of bean roots and the mitosis of bean root cells. If a large dose of radiation is given to a bean root mitosis is stopped for the time being, and neutrons are more effective in such inhibition than gamma radiation in the proportion of 1.6 to 1.0. When it comes to a question of lethal effect on bean roots, however, to reach a 50 per cent. mortality in the case of gamma radiation requires 700 "r" units, whereas in the case of neutrons it requires only the equivalent of 70. Another laboratory worker on this subject, Mr. D. E. Lea, said that it was clear that the differences between neutrons and gamma rays, in both their biological and physical action, were almost entirely quantitative and hardly at all qualitative. The same type of cell change is produced which is so familiar with *x* rays and gamma rays. The energy in the tissues is dissipated in the same way by ionization in all these radiations, but with the gamma rays and *x* rays the ions are separated by relatively considerable distances, whereas with neutrons the ions are much closer together. The quantitative difference is really a matter of ionic density.

[2] *Arch. Ophthal.*, Chicago, 1939, **21**, 211.
[3] *Ann. d'Ocul.*, 1938, **175**, 133.
[4] *Ophthalmologica*, 1939, **98**, 129.

THE NATION'S LARDER IN WARTIME

The Royal Institution recently arranged for a series of lectures to be given under the title of "The Nation's Larder," so as to bring together the views of various experts on the pressing problem of feeding the population of this country in time of war. By the courtesy of the Managers of the Royal Institution, and of the lecturers, we are printing abridged versions of these lectures during the next few weeks, beginning in our present issue with the first of the series, "Food in Relation to Health in Great Britain during the Past Two Hundred Years," by Professor J. C. Drummond, now Scientific Adviser to the Ministry of Food. Problems of food and of nutrition have aroused much interest in the medical profession during recent years, and the British Medical Association has taken a most active part in promoting this. Many readers will, no doubt, want to have the full text of the lectures, which will be published *in extenso* by Messrs. G. Bell and Sons, Ltd., York House, Portugal Street, London, W.C.2, during the course of the next few weeks at a popular price.

We regret to announce the death at Kingswood of Mr. Francis James Steward, M.S., F.R.C.S., consulting surgeon to Guy's Hospital.

The brilliant surgeon Laurence O'Shaughnessy, F.R.C.S., has been killed in action in Flanders while serving with the R.A.M.C.

THE NATION'S LARDER IN WARTIME

*This is an abridged version of one of a series of lectures recently delivered before the Royal Institution**

FOOD IN RELATION TO HEALTH IN GREAT BRITAIN

THE HISTORICAL BACKGROUND

BY

J. C. DRUMMOND, D.Sc., F.I.C.

Professor of Biochemistry, University of London

I have chosen to speak to-day about some of the changes which have occurred during the past two hundred years in the character of our national diet. In 1740 food was plentiful and cheap, and there is little cause to doubt that the person in humble circumstances, in both country and town, got ample and mostly good food. There had, it is true, been other times when food was cheap, but there had not then been the variety of food that was available at low cost to the poor in the middle of the eighteenth century. For hundreds of years the people of our country had been living, year in and year out, in the shadow of scurvy. Vegetables and fruits seldom came the way of the poor man. But garden vegetables and orchard fruit as we know them were brought to England by the Dutch gardeners who came over in the seventeenth century, and at the opening of the period we are reviewing garden vegetables were being produced in the small plots of the villagers, and many market gardens were springing up around the rapidly growing towns. It was at this period that the potato—not the sweet potato brought back by Hawkins in 1564, which soon lost its popularity, but *Solanum tuberosum* which we eat every day—became a staple article of diet in the north and west, and was being grown and rapidly becoming popular in the south.

A Working Man's Diet in the Eighteenth Century

The beginning of our period of two centuries saw the first clear signs of the wave of industrialization which was to sweep the country with ever-increasing force, but its effects were scarcely noticeable in 1740 so far as the diet of the mass of the people was concerned. In the north there were large supplies of dairy produce, and the ordinary person lived largely on milk, vegetables, potatoes, and oatmeal. In the south less milk was drunk, meat was more popular, and bread was wheaten.

I have taken the record of a labourer's family in the North of England in 1737. For his wife, two children, and himself he purchased over half a hundredweight of potatoes, fifteen quarts of milk, and nearly half a pound of butter a week. Meat seldom came their way. From the records of these purchases we can calculate what quantity of certain nutrients this family obtained. In the table which follows I direct attention to certain vitamins and mineral salts, because there will be nothing wrong with our wartime, or peacetime, diets if we have primary regard to these essential constituents.

On such a diet our eighteenth century labourer and his wife and children were excellently nourished. If more obvious proof of this assertion is wanted it is necessary only to look at the physique of those peasant peoples throughout the world whose daily diets are based on these types of food. South-Eastern Europe provides many striking examples. Little meat is eaten, but the staple diet is a coarse whole-grain bread, thick vegetable stews, and goat's-milk cheese. These people are strong and hardy, their children are rosy-cheeked, sturdy, and with firm teeth.

	18th Century Working Man's Diet in North of England	Estimated Requirement of Adult
Calcium	1.2	1.0
Iron (mg.)	23	15
Vitamin A (units)	6,600	5,000
Vitamin B (units)	1,300	500–700
Vitamin C (mg.)	110	75–100

It can be accepted that this primitive peasant type of diet will provide all the nourishment we require, both in childhood and maturity.

Fashion and Sophistication in Diet

A change in social conditions rapidly obliged the labouring people of England to adopt a less healthful diet than they had enjoyed in the first half of the eighteenth century. The accession of George III (1760) coincided with the opening of a sad chapter in social history. A series of fine seasons and good harvests gave place to a long succession of bad summers and spoilt crops. This was particularly unfortunate at a time when there was a rapid growth of town population, as the misery caused by high prices and scarcity was accentuated. Agriculture thrived, however, as a result of the scarcity, and it is at this period that the confiscation of the common lands, and even the tiny plots of the cottagers, which was legalized by the terrible Enclosure Acts, proceeded apace. The enclosure brought much land under a more efficient cultivation, but against this there has to be set the tragedy of the final dissolution of the simple village economy which had been the backbone of our social life for centuries. Agriculture became an industry, interested less in local requirements and more in the demands of the large and often distant towns.

The country people, flocking to the towns, tempted by the wages which industry was offering or because they could no longer support themselves in their village homes, soon acquired a craving for what they regarded as the higher standard of living of the townsfolk. For centuries the poor of the countryside had envied the rich man his table of red meats and his fine white wheaten bread. With the desire to eat more meat there grew something of the contempt which the rich man had always shown for the simple fare of the countryman.

Wheaten flour was prepared in the eighteenth century by grinding the grain in the type of stone mill which had been in use since time immemorial. In this process the berry was crushed between the millstones in such a manner that all parts—the floury endosperm, the tiny yellow germ, and the dark-coloured outer coats—were reduced to a fine powder—strictly speaking, the only genuine wholemeal flour, containing every bit of grain. It is greyish in colour because it contains the dark particles of bran, most of which are slightly larger than the particles of flour or broken-up germ. When this flour was sifted, or "bolted," as millers term it, through fabric,

* The lectures will be published *in extenso* by Messrs. G. Bell and Sons, Ltd., of York House, Portugal Street, W.C.2.

grades of flour were obtained which, depending on the mesh of the material, varied in colour from a very pale cream to one little less dark than that of the original flour.

The Colour of Bread

The former flour was what England had known for centuries as the finest wheaten flour. From it was baked the famous manchet of Tudor times, which was a "white bread" in that its colour was a pale cream or slightly "off" white. It was this quality of bread that the artisans of the growing towns craved for, and before the nineteenth century was out they had suffered terribly for their pride. When grain was short and much poor-quality flour was on the market in the hard times late in the century, unscrupulous millers and bakers did not hesitate to resort to all kinds of practices in order to try to improve its colour. Enormous quantities of alum were employed to enable the baker to produce a better-looking loaf than he otherwise could have done with the poor-quality flour at his disposal.

Apart from this, however, we must remember that those who could get unsophisticated wheaten flour were obtaining a nutritious food, differing markedly in character from the flour we buy to-day. The latter is made by crushing the grain between a series of rollers instead of grinding it between rotating stones. In roller crushing the little germ is flattened into a tiny disc and does not become pulverized as does the mass of starchy material forming the greater part of the grain. The germ is, therefore, held back when the crushed grain is sieved, and the flour is that much the poorer.

[Professor Drummond here described in more detail the process of the roller mill and what was meant by given percentages of "extraction" flour.]

The differing character of the "white" flour yielded by the stone mill and by the roller mill which rapidly ousted the former in the 'eighties of the last century is shown in the following table:

	Stone-ground "White" Flour	"Straight run" Roller-mill Bleached White Flour
Extraction	81%	72%
Protein	11.2%	10.7%
Fat	1.2%	0.7%
Carbohydrate	67.0%	80%
Calcium mg. per 100 g.	50	22
Iron mg. per 100 g.	4	1
Vitamin A (units per 100 g.)	200	0
Vitamin B_1 (units per 100 g.)	150	22
Calories per 100 g.	370	370

In respect of the major constituents—protein, fat, and carbohydrates—the differences are negligible. This is also reflected in the equivalent calorific value of the two types of flour. It was because of this that the new white flour seemed every bit as satisfying as had been the stone-ground flour of earlier times, and there is no doubt that it attracted the public enormously.

The Desire for Cheap Meat

Another consequence of industrialization was the growth of the desire of the town populations for cheap meat. Home production was able for a time to supply demand, but presently shortage caused rising prices and scarcity in town markets. One or two epidemics of cattle disease made the position worse, and in 1865 a visitation of the severity of a plague wiped out a large proportion of the livestock in certain areas. The high price of meat was the chief cause of the rapid development of canning in countries such as Australia and South America. This relatively cheap meat was already making an impression on the English markets as early as 1850. It was rather poor stuff, judged by modern standards—coarse-textured, badly packed, and not infrequently imperfectly sterilized. In consequence of faulty preparation much of it putrefied on keeping. There was a big outcry at the revelations of a Government inquiry in 1852, which investigated extensive loss of Admiralty stores of canned meat owing to decomposition on storage. The bad reputation which canned meat acquired in those early days of the industry made a very deep impression on the public mind, and I believe it is at root responsible for the fallacy, once widely believed but now wholly discredited, that canned meats are peculiarly prone to cause food-poisoning.

Another new food habit which grew as industrialization spread was tea drinking. The most popular drink of the townsman at the opening of the period we are discussing was undoubtedly gin, or what was sold as gin, the large proportion of it rank poison. The evil was finally checked not as a result of legislation or advice from well-meaning individuals but because the rising price of grain soon made it impossible for the wretches who produced the dreadful stuff to make it at prices the poor could pay. The rise in the price of gin coincided with a surprising drop in the price of tea and a relative cheapening of sugar, and before long the habit of tea drinking was widespread all over the country.

Late in the nineteenth century cheap butter substitutes were introduced. The first were crude imitations of natural butter, but they were at least made almost wholly from animal fats and had a vitamin content little below that of butter. With the introduction of the cheaper vegetable oils as raw materials for margarine manufacture the poorer people were buying a butter substitute which had no vitamin value whatever. Twenty years passed before the seriousness of that fact was recognized, and nearly forty before action was taken to ensure that all margarine should be the equivalent of a summer butter.

Victorian Regression

Throughout the Victorian era the nutritive value of the diet of the labouring classes steadily declined. Bread they ate in plenty, meat whenever they could afford it, and vegetables, other than potatoes, in quite insufficient amounts, while the consumption of milk steadily declined from the fairly high levels that seem to have existed in the first half of the eighteenth century. The switch-over to roller-milled flour in the 'eighties made a big difference to the nutritive value of the poor man's diet. I have records of a typical London working-class family in 1871. They ate large quantities of bread, a good deal of cheese, few vegetables other than potatoes, whilst suet puddings, meat pies, and stews figure often in the list. I have analysed the daily diet of one of this family, and it is instructive to see how the nutritive value of the diet would have been reduced had they continued to live on similar meals after their flour (some ten years later) had changed from stone-ground to roller-milled:

Amounts per Day	Estimated Need of Adult	1871 Diet	Same Diet after Introduction of Roller-milled Flour
Calcium g.	1.0	0.7	0.5
Iron mg.	15	21	9
Vitamin A units	5,000	2,200	280
Vitamin B_1 units	500–700	1,050	320

I have elsewhere ventured the opinion that at the close of the nineteenth century, when we were displaying to the world at Queen Victoria's Jubilee the might of our Empire, the nutritional condition of our working people

was probably worse than it had been since the great dearths and famines of Tudor and mediaeval times.[1]

Since then, thanks in part to the steady rise in the standard of living and also in part to the rapid advance of knowledge which research work has produced, conditions have improved with encouraging rapidity. To-day we feel reasonably certain that we know what are the important constituents of our diets and how much of them we should eat to build up our bodies when we are young and keep them in good working condition when we have reached maturity.

Rising Standards

As a result of learning what foods are good for them, and also because the standard of living has been rising since the last war, the people of this country have increased their consumption of fruit by 88 per cent., of vegetables other than potatoes by 64 per cent., and the drinking of milk by about 50 per cent. since 1913. This must mean that they have been eating less of other foods, because the average individual subconsciously adjusts his or her meals to physiological requirements. The constancy of most of our weights tells us how well balanced that adjustment has been. The proportion of people who habitually overeat is not large. If it were we should more closely resemble our Georgian forefathers, whose large bellies and paunches are so obvious a feature of the eighteenth century prints.

A rise in the consumption of dairy produce, fruit, and vegetables means that the consumption of bread falls. The reverse is also true: when prices rise so as to place the more expensive foods beyond the reach of the poorer people the change is usually reflected in increased purchases of bread. In this sense bread is the food of poverty. I do not feel that the position of bread as an article of diet in our country will have become satisfactory until we recognize, and the millers and bakers also recognize, that it fulfils two quite distinct functions. From one point of view we must regard it as an essential food of everyday life, and, from the other, as a pleasant accompaniment of our meals. One calls for a healthful food which shall nourish the people and play a part in protecting against illness, and the other visualizes all the attractive types of bread and rolls we know so well.

[Professor Drummond illustrated his point by a reference to the "Oslo breakfast," or, in London, the "health dinner," an essential part of which was wholemeal bread. When the main part of the meal was finished the child could, if it was still hungry, eat as much bread and margarine as it wished and could choose between white and wholemeal bread.]

I believe the time is coming when two types of bread will be on sale in every baker's shop. One will be baked from 80 to 85 per cent. extraction flour, or even perhaps wholemeal, the other from the ordinary white flour we have to-day. People will buy some of each, eating the one as a health-giving food, and the other when they feel they want a change. But if this is to happen we must get rid of the extraordinary idea that brown breads and wholemeal breads are luxuries for which a higher price can be charged. That is just nonsense.

The Nutritional Front

My thesis has one main argument: Ensure a basic intake of essential protective foods for the population, and after that one need have few cares as to what is eaten. Our enemies are fully aware of the importance of this principle. Their nutrition experts have played a big part in making plans for this war. If Germany is able to maintain supplies her resistance will not be broken on the nutritional front, as it was in the last struggle. Her scientists will see to that. The present German rations are based on the simple but sound principle that a "peasant diet" of "high extraction," or wholemeal bread, plenty of vegetables and potatoes, and some dairy produce in the form of cheese or separated milk, provides all the essentials of sound nutrition. We can profitably compare the nutrients such a diet provides with those we looked at earlier in this talk and also those which pre-war studies revealed as often characteristic of the diets of the poorer population:

	Estimate of Requirements of Adult	1939-40 German Diet	18th Century Labourer's Diet*	Orr's Mean Values for Families Spending less than 8s. per Head on Food, 1936
Calcium g. ..	1.0	0.6–0.7	1.2	0.5
Iron mg... ..	16	17–32	23	9.6
Vitamin A units	5,000	2,300–2,700	6,600	1,220
Vitamin B_1 units	500–700	580–940	1,300	350
Vitamin C mg...	75–	55–	110	55

*The range covers actual rations allotted to adults engaged in sedentary work to those for heavy workers. The figures also take into account a likely consumption of certain unrationed foods.

The German public is not at the moment getting so good a diet because potatoes and vegetables are in very short supply owing to the severity of the last winter, but the figures are instructive in showing how a supply of "high extraction" bread gives even the poorest people valuable protection against those deficiencies which characterize many ordinary working-class diets—namely, of calcium, iron, and vitamin B_1.

I for one am hoping that this war will give us a great opportunity for establishing in the minds of our people the importance of these principles. The Ministry of Food, the Board of Education, and many other bodies are now engaged in a big drive to spread the knowledge about the right foods and the right way to use them. If this campaign has the effect I believe it will have we shall soon reach the goal so dear to many of us—that is, when the poorest parents in the country will be as certain that their children get the foods required for health and strength as they are to-day that education will be provided.

[1] *The Englishman's Food.* By J. C. Drummond and Anne Wilbraham. 1939. Jonathan Cape.

Considerable improvement in the standard of medical education in the Presidency of Bengal is recorded in the last triennial report on the working of hospitals and dispensaries in the Presidency by Major-General P. S. Mills, I.M.S., Surgeon General with the Government of Bengal. There are nine medical schools in the Presidency—six Government and three private schools—in which training is given up to the standard of the final licentiateship examination of the State Medical Faculty of Bengal, while medical education up to the standard of the M.B. degree of the University of Calcutta and the M.M.F. diploma of the State medical faculty of Bengal was provided as usual by the Calcutta Medical College and the Carmichael Medical College in Belgachia. In the Bengal medical schools, taken as a whole, there were 8,820 medical students under training during the three years, of whom 1,114 qualified. Some of the Government medical schools are reported as still being inadequately provided with accommodation and materials for medical training, and plans for improving them up to the requirements of the Bengal Council of Medical Registration have been energetically instituted. The medical qualifications obtained at the two medical colleges under the University of Calcutta were again recognized by the General Medical Council of Great Britain with effect from October, 1936, after a lapse of over six years.

TRAINING OF MEDICAL STUDENTS FOR WAR SERVICE

A PRACTICAL SCHEME

BY

A. C. FRAZER, M.B., B.S.

Captain R.A.M.C., T.A.R.O.

(From St. Mary's Hospital Medical School, London)

The majority of medical students are healthy, public-spirited young men who feel that during this time of national crisis they would like to do more to help in the national war effort. There is no doubt that their primary efforts must be directed towards the pursuit of their medical studies, but by sacrificing a small amount of their leisure hours much valuable training can be done. I published the outline of this scheme to the students here nine days ago and there was an immediate and enthusiastic response. The training has now been in operation for a week and there are 200 men enrolled and taking the course. The instruction includes first aid, anti-gas training, sanitation and hygiene, weapon training, and elementary military tactics. Physical training classes are also being inaugurated.

Organization

The training unit can be divided into preclinical and clinical groups, which are subdivided into squads of about twenty for practical work. The assistance of many students has been enlisted for administrative and instructional purposes. Weapon training is being organized and taught by members of the hospital rifle club. Tactics and map reading are being dealt with by a hospital student holding infantry Certificate B who was until recently a senior N.C.O. in the infantry unit of the University of London O.T.C. Several of his colleagues in the infantry unit have kindly offered to assist in training. Practical instruction in first aid and anti-gas measures is being given by a group of ten students who hold medical Certificate B and were senior N.C.O.s in the medical unit U.L.O.T.C. The lectures on hygiene and sanitation, first aid, and anti-gas measures are being given by me. I am fortunate in having recent experience in Army courses and training in these subjects. The full co-operation of all the members of the unit in making the scheme a success has been a most striking feature of the organization.

Times of Work

The period adopted for training is 5 to 7 o'clock each evening from Monday to Friday inclusive. Classes are arranged to avoid clashing with the programme of medical teaching. Week-end courses of lectures are arranged for Saturday 2 to 4 p.m. and Sunday 11 a.m. to 1 p.m. The first course consisted of four lectures on blister gases. The maximum time demanded from any member of the unit per week is nine hours—five during the week and four at the week-end.

Programme of Course

The immediate programme only will be dealt with in this article. It was decided that owing to the urgency of the situation the training should concentrate for the first few weeks on the more basic subjects and should be designed to make the fullest use of the knowledge already in the student's possession. The following programme was therefore adopted:

Clinical Students

1. Hygiene and sanitation, with special reference to refugee problems.
2. First aid and casualty work.
3. Anti-gas training and treatment.

Preclinical Students

1. Weapon training.
2. Elementary tactics and map-reading.
3. First aid.
4. Anti-gas training.

Syllabus

During the first two or three weeks of training the following should be adequately covered:

HYGIENE

Lectures.—General principles, communicable diseases and their prevention, water, food, practical sanitation under field conditions, effects of exposure and prevention.

Practical.—Discussion and solution of problems of hygiene and sanitation such as might occur in this country under war conditions.

ANTI-GAS

Lectures.—Classification of gases, methods of use, effects of gases (blister and tear in detail). First aid and medical treatment. Protection and decontamination.

Practical.—Treatment of gas casualties. Use of respirator. Acclimatization to working in respirator.

FIRST AID

Lectures.—Principles. Wounds, haemorrhage, shock, fractures, dislocations, and burns—their characteristics and treatment. Improvised methods. Bandages and splints.

Practical.—Practical work in bandaging (triangular), the immobilization of fractures, and treatment of shock.

WEAPON TRAINING

Lectures.—Mechanism, use, and care of fire-arms. Fire discipline.

Practical.—Firing practice with various arms under expert supervision.

ELEMENTARY TACTICS

Lectures.—Appreciation, messages, and reports, field-craft, map-reading, tactical use of gas, and general tactical considerations.

Practical.—Practical exercises, including night operations.

All work is dealt with from the practical aspect. Everything is done to encourage initiative, improvisation, and practical experience.

Future Policy

At present the whole object is training. Men who are already under obligations in the event of air raids are not excluded, since the information obtainable during this course has a very widespread usefulness. It is a useful adjunct to medical training, it is some preparation for eventual service in the R.A.M.C. or elsewhere, and it may be of value in any form of A.R.P. work. Contact is being made with the various national organizations to discover how best these trained men may be used for the national benefit should the necessity arise. When definite units are formed men under special obligations must, of course, be excluded to avoid interference with existing organizations. The present policy is train thoroughly and train now. The future policy depends upon circumstances. If a sudden national crisis occurs within the next few months the men will be ready for whatever may be required of them. If this does not happen the training can be broadened to form a basis for preliminary training for the Services. In all circumstances their training in medicine continues unabated, except in the event of an early crisis, when it is expected that medical training will be in abeyance in any case for some months. When the crisis has passed the policy must be decided by the appropriate authorities.

Conclusion

This plan is working well. It has been received enthusiastically by the students. It does not interfere unduly with the medical training. It will be of real value in an emergency. It must be done now. I should welcome criticisms or suggestions, and would be very pleased to give any further information on this matter to people at other hospitals who may wish to inaugurate some similar plan.

Nova et Vetera

A MEDICAL GEOLOGIST

The Journal of Gideon Mantell: Surgeon and Geologist. (Covering the Years 1818–1852.) Edited, with an Introduction and Notes, by E. Cecil Curwen, M.A., M.B., F.S.A. (Pp. 316. 12s. 6d. net.) London, New York, Toronto: Oxford University Press. 1940.

For some unexplained reason the members of the most exacting of all professions, medicine, appear to find most time to devote to other pursuits outside their regular work. Gideon Mantell, Sussex surgeon, son of a Lewes shoemaker, is a case in point, for he was successful in his profession and a famous geologist. Being a man of inexhaustible energy, he contrived to lead a double life—that of a hard-working surgeon and popular accoucheur, while devoting a large part of his time to the study of geology. He thought nothing of leaving home at four or even three o'clock in the morning and, after paying a few professional visits, would mount his horse and ride perhaps sixty miles in a day examining quarries for fossils. There is no hint in his journal that any of his patients objected to such early visits from their doctor.

This diary is curiously self-revealing, as all good diaries should be, and evidently was written with no idea of future publication. At the age of 32 Mantell published the first of his many books on geology, and admits his disappointment that it had "not forwarded him that introduction to the first circle in this neighbourhood which I had been led to expect it would have done." He formed a geological museum to which the "first circle," headed by the Prince Consort, flocked in their hundreds. He had a flourishing practice at Lewes, but was persuaded by Lord Egremont to move to Brighton, with disastrous results. But the museum grew in size and renown, so that at last Mrs. Mantell and the children had to be sent into lodgings in the neighbourhood. After a few years at Brighton he migrated to Clapham and eventually to Chester Square, in order to be able to attend meetings of the various societies in London, including the Royal Society, to which he belonged. The public interest at this period, 1830–50, in geology was extraordinary. Even at the small town of Chichester Mantell lectured before an audience of over four hundred. During the last eleven years of his life he suffered from frequent attacks of severe pain from some obscure spinal disease: his spinal column is preserved in the Museum of the Royal College of Surgeons.

Mantell died in 1852 from an overdose of laudanum at the age of 62, after attaining for himself a lasting place of honour in the science of geology. He met scores of distinguished people of all classes and jotted down in his journal amusing and interesting descriptions of them. Among these are Talleyrand, Michael Faraday, Brunel, Bulwer Lytton, Richard Owen, Mrs. Percy Bysshe Shelley, Charles Lyell, and such famous actors as the Keans and the Kembles. Among well-known surgeons will be found Benjamin Brodie, John Abernethy, Thomas Bell, Everard Home, and William Lawrence.

After reading this absorbingly interesting journal one is left with a vivid portrait of a man of amazing energy and unbounded ambition, selfish in some ways, but one who would often put himself to much trouble to alleviate suffering and to right a wrong. There is one fault to be found with this edition of Mantell's journal, which is that the admirable introduction by Dr. E. Cecil Curwen is far too brief.

PHILIP GOSSE.

MID-VICTORIAN MEDICAL EXPENSES

I have in my possession (writes G. F. K.) the account books of my grandfather dating from the year 1862, which were kept with the same meticulous care as those of the Lincolnshire clerk mentioned in this column on January 20, p. 103.

In 1866 he had just finished his articles in a Dublin merchant's office and was then paid £110 per annum as a clerk. He was a healthy person and did not require much medical attention (he only died just over four years ago at the age of 94), but in May, 1866, the doctor charged him 5s. for a visit and on the next day he paid the chemist 1s. for medicine presumably made up on the doctor's prescription.

He got married in 1870, incidentally to a doctor's daughter, and at this time was manager of the office in Dublin and earning about £300 a year. In January, 1873, an entry appears, "Dr. Wilde's fee—wife's eyes £1." This, of course, was Sir William Wilde, the father of Oscar Wilde, who was in practice in Dublin as an oculist. In December of the same year a Dr. Mason is paid £1 for attendance on one of the children for bronchitis. In May, 1874, the expenses of his wife's confinement were £4 2s., which were apportioned as to the doctor (appropriately named Stork, unless this was meant as a joke), £2 2s., and as to the nurse, who stayed two weeks, £2. In 1875 the family went to New York, where my grandfather again held a post as office manager, but now at a salary of about £800 per annum. It is interesting to note that the expenses of a confinement which took place in 1878 were nearly double those which were charged on the similar occasion in Dublin four years earlier, but again the fees were almost equally divided between the doctor and the nurse. The doctor got 22 dollars and the nurse 20.

AIR-RAID SHELTERS

The A.R.P. Co-ordinating Committee (chairman, Professor J. B. S. Haldane, F.R.S.; vice-chairman, Professor J. R. Marrack, M.D.) on June 6 asked Sir John Anderson to receive a deputation of eminent scientists and technicians who have made a special study of air raid precautions. The deputation will urge on Sir John the necessity for immediately extending and improving the shelter provision in this country. The proposals of the committee are based on a detailed investigation of the position in all parts of the country. The survey which the committee has carried out shows that in London one of every two residents is without shelter. The position in other vulnerable areas is only slightly better. While a few areas have very good protection—some have bombproof shelters—the variation in standards is tremendous, so that the majority of areas have very poor protection indeed. The tendency is for new shelters to be built to even poorer standards and for the omission of essential amenities, such as lighting, lavatory accommodation, and first aid. The detailed proposals of the committee include the immediate construction of shelters on the principle submitted by it to the Ministry of Home Security and recently approved by the Ministry's experts (the principle of constructing blast and splinterproof shelters so that they can subsequently be made bombproof). While these are being constructed on available sites surveys should be carried out of the numbers of persons requiring further shelter. Shelters should be provided with proper amenities, including forced ventilation. This latter is particularly important, for not only does it reduce the discomfort of overcrowding, but it can increase the effective capacity of a shelter by some 60 per cent. and reduce its cost per head by some 20 per cent. to 30 per cent. The principle should also be adopted of giving all persons communal shelter, thus avoiding the duplication involved in providing separately domestic shelters, shelters at work places, and public shelters. The committee reiterates the need for bombproof shelters, but stresses that if meanwhile the problem is tackled with the energy and dispatch that the situation calls for, blast and splinterproof protection for many thousands in the type of shelter advocated can be provided within four weeks, and that in a comparatively short space of time thereafter no one in a vulnerable area need be without a heavily protected shelter.

APPEAL FOR NURSES AND MIDWIVES

Trained nurses are urgently required for the care of Service casualties from France and Belgium who are being received in increasing numbers in Emergency Medical Service hospitals, which must also be prepared for air raid casualties. All trained nurses who are not already nursing in hospitals or engaged in public health work or at first-aid posts are asked to offer themselves for whole-time work in any hospital in Great Britain to which they may be sent. The rate of pay is £90 a year for trained nurses, £55 for assistant nurses, plus board, lodging, and laundry (charge sisters have an extra allowance). Those who enrol now are guaranteed at least twelve months' employment. Applicants in London should write, telephone, or apply in person with full particulars of their qualifications, age, earliest date of availability, and part of country in which, if possible, they prefer to serve, to the Ministry of Health, Romney House, Marsham Street, London, S.W.1 (telephone Abbey 2595). In other parts of England and Wales they should apply to the medical officer of health of their county or county borough, or, if they prefer, to the Ministry at the address just given. Applicants in Scotland should apply to the Civil Nursing Reserve, 40, Melville Street, Edinburgh, 3. Those who have already joined the Reserve but have not hitherto been able to offer whole-time service wherever they are sent are asked to reconsider their decision.

It is announced that the Secretary of State for War has consented to the release of a large number of mobile V.A.D.s, hitherto under obligations to the Army, so that they may be free to join the Civil Nursing Reserve as nursing auxiliaries, prepared to serve whole-time in any emergency hospital in Great Britain to which they may be sent. The V.A.D. Council is notifying individual members of their release from Army obligations, and the detailed arrangements necessary to secure their being added to the roll of the Civil Nursing Reserve. V.A.D.s who enrol in the Reserve at once will be eligible for twelve months' continuous employment on being called up for service in a casualty hospital.

The Minister of Health and the Secretary of State for Scotland have issued an announcement to all qualified midwives in England and Wales under the age of 55 who have done midwifery within the last ten years and who are not now in full-time employment, asking whether they would be willing, if called upon, to accept a salaried residential post at short notice in a maternity home in a reception area. Offers of service should be made to the Central Midwives Board, 73, Great Peter Street, Westminster, S.W.1 (telephone No. Abbey 2414), or to the Central Midwives Board for Scotland, Royal College of Surgeons, 18, Nicholson Street, Edinburgh. The following particulars should be given: Full name and address, and telephone number if any, age and experience saying whether the midwife is a general trained nurse, the number of the C.M.B. certificate, the counties in which she would be willing to work, and the length of notice she would need before taking up duty.

The annual report of the Board of Management of the Manchester Royal Infirmary states that the war has meant a diversion of effort and a multitude of tasks that could not have been visualized in past years. A small drop in the number of patients treated was caused by the necessity for keeping a number of beds empty for a time. Some 400 were reserved for air raid casualties, so that the average number of occupied beds for the year fell from 549 in 1938 to 485 in 1939, and the cost per occupied bed rose from £210 0s. 2d. to £251 4s. 11d. Ordinary expenditure amounted to £155,264, compared with £149,443 in 1938. The net deficit for the year was £14,474, and would have been much greater but for the receipt of £10,233 from the Ministry of Health for beds reserved for a time for possible air raid casualties. Air raid precautions at the hospital and the convalescent home cost £3,980, and the provision of additional supplies as a reserve for war emergencies cost some £3,000.

SCIENTIFIC ADVISORY COMMITTEE ON FOOD

Mr. Attlee, Lord Privy Seal, as chairman of the Food Policy Committee of the War Cabinet, has set up a committee "to consider and advise upon problems of national food requirements and of home food production with special regard to the shipping and foreign exchange likely to be available for imports of food and animal feeding-stuffs, and the labour and other resources likely to be available for home production." The chairman of the new committee is Sir William Bragg, President of the Royal Society, and the deputy chairman is Sir Alan Garrett Anderson. The other members are: Professor A. W. Ashby, of the Department of Agricultural Economics, University College of Wales, Aberystwyth; Professor E. P. Cathcart, M.D., F.R.S., regius professor of physiology, Glasgow University; Mr. Henry Clay, former economic adviser to the Bank of England; Professor F. L. Engledow, F.R.S., who holds the chair of agriculture at Cambridge; Mr. W. Gavin, agricultural adviser to the Ministry of Agriculture; Sir Edward Mellanby, M.D., F.R.S., secretary of the Medical Research Council; Sir John Boyd Orr, M.D., F.R.S., director of the Rowett Research Institute, Aberdeen; and Professor J. A. Scott-Watson, who holds the chair of rural economy at Oxford. The secretary of the committee is Professor D. S. M. Watson, F.R.S., member of the Agricultural Research Council.

C.S.M.M.G. MASSAGE CORPS

In 1937 the council of the Chartered Society of Massage and Medical Gymnastics first gave thought to the way in which its members could best serve their country in time of war or national emergency. The result of such deliberation was a decision to organize a massage corps, and to this end a committee was appointed.

The original members of the committee were the Lady Essex French, Dr. J. Sainsbury, and two members of the society's council. Later others joined the committee to give specialized advice and for liaison purposes: Dr. L. D. Bailey (chairman of the council), Mr. R. C. Elmslie, F.R.C.S., Dr. A. W. Moore (Ministry of Pensions), Sir Robert Stanton Woods (Consultant Adviser in Physical Medicine to the Ministry of Health), Miss Lace (Ling Association), and a member of the society to represent the male members and members in private practice.

Enrolment and Organization

The committee decided to send an explanatory leaflet and enrolment form to every member of the society. This met with an immediate response; since that time some 6,000 members have enrolled in the corps. Members were invited to enrol in three sections: mobile, for service at home or abroad; immobile, for service in their own town or city; or in a special section, for those already attached to hospitals or units which will require their services in time of war.

The country was then divided into regions as adopted by the Ministry of Health for hospital services, and a regional organizer appointed in each. These organizers have worked indefatigably in first endeavouring to obtain the enrolment of every member in their region and then organizing refresher courses. Many of these courses have been held and have been of the greatest benefit to members. The Massage Corps in Scotland is organized by a Scottish committee, but the whole organization comes under the control of the Director of the Massage Corps and the committee at headquarters. Members have been graded according to their experience and qualifications, taking into account special experience in such subjects as plaster work, orthopaedic work, etc.

The Ministry of Health has accepted the Massage Corps as the enrolling body for massage personnel, and at the suggestion of the Ministry a supplementary list has been set up for the enrolment of certain qualified masseurs/masseuses who are not members of the Chartered Society. The Massage Corps works in close co-operation with the British Red Cross

Society, who have undertaken that massage vacancies in their hospitals and clinics will only be filled by members of the Chartered Society.

The allocating of members of the corps will be carried out by a small Allocation Committee working in co-operation with the regional organizers. The corps has its own uniform, armlet, and badges. The wearing of the full uniform is optional, but every member is urged to wear the armlet and brooch badge.

THE KING'S FUND AND RADIOTHERAPY

A CONSULTING PANEL OF PHYSICISTS

Since the gift of a large sum of money to the King Edward's Hospital Fund by Sir Otto Beit in 1928 for the purchase of radium for use in the treatment of cancer the Fund has taken an ever-increasing practical interest in the work associated with this and other gifts especially reserved for radium.

When the National Radium Commission came into being in 1929, working arrangements were soon made between it and the Fund whereby the latter body became responsible for seeing that the radium needs of the Metropolitan area were satisfied; and there has, from the start, been the friendliest co-operation between them relating to the special requests of the Commission for reliable data upon the radium treatment of cancer in London. In the developments of the last three years the Fund has been assisted by an expert Radium Committee, now presided over by Sir Cuthbert Wallace. Recently this committee has been considering in what way radiological treatment could be improved, and the Fund has approved the formation of a Panel of Consultant Physicists. The helpful co-operation of institutions where there are groups of physicists specially concerned with radiological treatment has facilitated the establishment of such a panel, and the King's Fund highly appreciate their action. The chief reason that has led to this step is the realization that radiotherapy should be, can be, and is at some centres carried out on a quantitative basis, and that for this purpose the services of a physicist are necessary.

The panel is designed to serve the needs of the many hospitals in which radium and *x*-ray treatment is carried out, but at which the employment of a physicist is precluded by expense and the staff have no such assistance. These hospitals will be free to use the services of the physicists on the panel, whose task would not be to prescribe doses of radiation (*x*-ray or radium)—which is the province of the medical radiologist—but to advise upon all those considerations which have to be taken into account before the prescribed dose is given to the patient. It is here that the physicist helps to put the treatment on a quantitative basis. A big field of usefulness lies, too, in the checking and calibration of the wide range of instruments used in radiotherapy.

The groups of physicists constituting this panel are as follows:

Dr. H. T. FLINT and colleagues,
Physics Department, Westminster Hospital, S.W.1.
Mr. L. G. GRIMMETT and colleagues,
Physics Department, Radium Beam Therapy Research,
Radium Institute, Ridinghouse Street, W.1.
Professor F. L. HOPWOOD and colleagues,
Physics Department, St. Bartholomew's Hospital, E.C.1.
Dr. W. V. MAYNEORD and colleagues,
Physics Department, Royal Cancer Hospital,
Fulham Road, S.W.3.
Professor S. RUSS and colleagues,
Physics Department, Middlesex Hospital, W.1.

In the city of Rio de Janeiro there are thirteen hospitals with a total of 4,143 beds, two out-patient departments, and five dispensaries available for the gratuitous treatment of the population. The State of Rio de Janeiro contains a further ten hospitals with 3,915 beds.

Reports of Societies

AGRANULOCYTOSIS AFTER SULPHONAMIDE THERAPY

At the last meeting of the Section of Obstetrics of the Royal Academy of Medicine in Ireland, with the President, Dr. R. M. CORBET, in the chair, Dr. A. W. SPAIN read a paper on agranulocytosis following chemotherapy, which is published this week at page 930.

Professor J. MCGRATH said the blood count clearly indicated a severe anaemia with agranulocytosis. The question arose whether the condition was primary idiopathic or secondary agranulocytosis. Although the former could occur at almost any age, it was rare before the age of 40, and the progress of this case showed that it was a fulminating acute condition—rare in the idiopathic type. Furthermore, the malaise, fever, and sore throat had followed the blood condition. Sulphonamide drugs had been given, although apparently in small and safe amounts. There was no evidence of gingivitis or vaginal inflammation. The statement made by Whitby and Briton that an absolute increase in the monocytes suggested a good prognosis had not been borne out in this case. Agranulocytosis might also be caused by other drugs—notably amidopyrine, barbiturates, benzol, atophan, quinine, arsenic. It was clear from various observations on the amidopyrine-barbiturate group that a sensitizing dose was necessary. Where there was an idiosyncrasy this sensitizing dose might be small (15 to 30 grains). Once a patient was sensitized, a small (5 grain) further dose might precipitate a fulminating attack of agranulocytosis. This had not been proved, but might very likely be also true of the sulphonamides. If it were true, then clearly the dosage mentioned (30 to 50 grammes) as being necessary to produce agranulocytosis might in many cases be too high. This illustrated another danger—that of allowing such potentially dangerous drugs to be sold without control. A few tablets taken for a sore throat on casual medical advice, or without advice at all, might ultimately result in the sensitization of a number of persons. Even the intensive short course (three days—18 grammes) method of administration might not avoid disaster in these cases. Colebrook had stated that the dangerous period with the sulphonamides was about the sixth to seventh day after the beginning of a course. This had been borne out in the present case. Professor McGrath said he had been unable to obtain any clear record whether the danger of sulphonamide therapy was the total amount given at one time or the concentration attained in the blood. There was some indication that metabolism and excretion might be hindered in some persons, with the result that the concentration in the blood became unduly high.

The Master of the Rotunda Hospital, Dr. A. DAVIDSON, said he had never seen a case similar to Dr. Spain's. He had seen one or two very bad reactions to prontosil in the way of rashes, vomiting, sickness, and drug fever; he personally thought that sulphapyridine was more dangerous than prontosil. The public had a great knowledge of M & B 693 (sulphapyridine) and were inclined to use it without medical supervision. He wondered if in Dr. Spain's case there had been a generalized infection as well as the local condition. Dr. E. T. FREEMAN referred to a case somewhat similar to Dr. Spain's which he had seen three years ago. The patient had had a sore throat for twenty-four hours and had been given three prontosil tablets the night before he had seen him. He then was extremely ill, with a fast pulse and a temperature of 104° F. He thought that the patient might possibly be suffering from agranulocytosis, but was not at all certain. That evening he developed jaundice. The patient had been in the habit of taking odd tablets, and after his death a drawer full of pyramidon tablets had been found in his bedroom. Dr. J. S. QUIN mentioned a case somewhat similar to Dr. Spain's, in which the patient had been given four tablets of M & B 693 (sulphapyridine) for a mild urinary infection. A blood count had been done at the end of twenty-four hours

and again at the end of forty-eight hours. The report of the first count had not been received when the second dose of sulphapyridine was given. When it was received, after the second dose had been given, it showed that the white cell count was down by 50 per cent. The drug was immediately stopped. The second blood count showed the white cell count to be still further down. Dr. B. PRINGLE referred to a non-fatal case of agranulocytosis in which sulphapyridine was given for lobar pneumonia. She had had 45 grammes. He personally did not think that sulphapyridine was more potentially an agranulocytosis-producing drug than sulphanilamide. He asked Dr. Spain if his patient had complained of pains in the bones, and said they had been very severe in his patient. The Master of the National Maternity Hospital, Dr. JOHN CUNNINGHAM, said that they had been using these drugs in the hospital pretty extensively since they had come on the market, and he had never seen a case of agranulocytosis.

Dr. SPAIN in reply said that when his patient had first developed fever she had been given some phenacetin and caffeine, but he was quite certain she had not had pyramidon. The patient's condition had not at any time suggested an infective condition with septicaemia. The patient had had pains in her bones, but they had never been severe.

BRITISH ORTHOPAEDIC ASSOCIATION

The British Orthopaedic Association held its annual meeting in London at Manson House on May 3 under the presidency of Professor T. P. MCMURRAY. In the morning short papers were presented, and in the afternoon members attended the Royal National Orthopaedic Hospital, the staff of which presented a varied and instructive clinical demonstration. At the association dinner at the Langham Hotel the guests included Lieutenant-General Sir William MacArthur, Director-General A.M.S., and Colonel J. A. MacFarlane of the Canadian Army Medical Service.

Summary of the Papers

Tuberculous Arthritis of the Ankle and Tarsus, by W. R. J. MITCHELL (Liverpool). A series of 169 patients were reviewed, of whom it had been possible to follow up in detail seventy-seven children and forty-five adults. The conclusions drawn were that an excellent result followed prolonged and efficient conservative treatment in children, while in adults, especially over the age of 45, amputation without delay was probably the best treatment rather than conservative treatment or the less radical operative measures such as attempted excision of foci or arthrodesis. An important observation was that the poor results, including death, in adults were due to tuberculous lesions in other parts of the body which appeared subsequent to the conservative treatment of the original focus, whereas of fourteen patients in whom amputation was performed early thirteen seemed to be completely cured.

Extirpation of the Pronator Quadratus Muscle for Spastic Paralysis, by ROBERT I. STIRLING (Edinburgh). The view was expressed that many pronation contractures were due to a contracted pronator quadratus. Extirpation of the latter muscle followed by intensive re-education of the biceps and supinator muscles had achieved good results in sixteen patients. A well-illustrated survey of the anatomy of the pronator quadratus was given.

Ischio-femoral Arthrodesis, by H. A. BRITTAIN (Norwich). In an elaboration of a previous communication Mr. Brittain outlined the advantages of ischio-femoral extra-articular arthrodesis of the hip as opposed to ilio-femoral, especially in the late treatment of tuberculous disease. The steps of the operation consisted of a subtrochanteric osteotomy, through which the ischium immediately below the acetabulum was "rawed." A large autogenous bone graft was inserted between the femoral fragments and embedded deeply in the ischium. The procedure had proved successful in achieving bony ankylosis in twenty of the twenty-eight patients in this series.

Stresses, Strains, and Spondylolisthesis, by NORMAN CAPENER (Exeter). In this review of spondylolisthesis Mr. Capener discussed the importance in general of a proper appreciation of stresses and strains in orthopaedic conditions as understood in dynamics and statics. The cause of the underlying defect in the interarticular portion of the neural arch (spondylolysis) was still *sub judice,* but the possibility of chondrovascular defects in the neural arch was considered important. In the anatomical and mechanical conditions limiting displacement of the vertebral body, the ilio-lumbar ligaments and an intact nucleus pulposus appeared of particular importance. At all ages treatment should be conservative, with two exceptions: (*a*) when evidence of increasing displacement was present in adolescence, and (*b*) when pain persisted in spite of conservative measures. In both exceptions a posterior spinal fusion should be performed. The anterior transperitoneal fusion was condemned as unnecessary and unjustifiably dangerous.

Dislocation of Carpal Semilunar, by F. W. HOLDSWORTH (Sheffield). A series of eighteen cases was reviewed. Following a study of the anatomy and mechanism of the wrist, it was concluded that normal dorsiflexion entailed a screw movement, finally locked by impaction of the os magnum on the scaphoid and the scaphoid on the radial styloid. Violent dorsiflexion tended to "strip the thread," and the main strain fell in the region of the apex of the screw—that is, the head of the os magnum, producing one of the several forms of so-called dislocation of the semilunar bone. It was emphasized that manipulative reduction of a recent dislocation could most easily be achieved by traction in palmar flexion, since this position opened up most widely the space between the os magnum and the radius. In injuries neglected for longer than fourteen days excision of the semilunar provided better results than operative replacement, for the latter procedure is often followed by sclerosis of the bone and osteo-arthritis of the wrist. Results were not so satisfactory if it was necessary to remove more than the semilunar.

Reaction of Bone to the Pressure of Fluctuant Tumours, by V. H. ELLIS (London). Comment was made on the lack of knowledge about the factors which stimulate osteoblastic or osteoclastic activity, but it was generally agreed that osteoclasts were the only cause of bone absorption. The latter was the normal response of bone to continuous pressure, but there were differences between the results of pressure by hard and by fluctuant tumours—for example, aneurysm, abscess, bursae. In these, although absorption took place, there was always a line of resistance formed by osteoblastic activity.

TREATMENT OF WAR FRACTURES

At a meeting of a medical society of the B.E.F. on April 18, with the president, Colonel F. WHALLEY, in the chair, Colonel MAX PAGE read a paper on the treatment of fractures of the extremities under war conditions.

Colonel Page pointed out that the main difference from civil practice which had to be considered in war was the preponderance of open fractures due to direct injury. Another factor which influenced the method of treatment of these injuries in an expeditionary force was the need to employ apparatus which left the patient transportable in comfort and safety at short notice. He proposed to consider, first, the general principles which were applied to avoid or minimize wound infection, and, secondly, the specific appliances suited to various fractures during the movement of the wounded man from the field to the base. These latter observations would apply to simple as to open fractures.

It was now generally accepted that wound excision (the *épluchage* of our French colleagues) was the only effective procedure which could check infection in contaminated wounds. To be effective this cleansing operation should be undertaken as soon after injury as possible. If the patient did not come into the surgeon's hands for about eighteen hours or more after being hit, free wound excision was no safeguard and might be dangerous. In such instances a full prophylactic course of sulphanilamide should be given. He thought that

operation in late cases should be limited to the removal of easily accessible foreign material and the establishment of drainage. In the operation of *épluchage* he deprecated the excision of any viable skin, though free incision was necessary for proper access. It must be admitted that a really complete wound excision was seldom practicable in the case of open fractures caused by missiles. Conservation of important neuro-vascular bundles was the first handicap, and the undesirability of removing all detached fragments of bone the second. In general, fragments with periosteal or vascular attachments should be left *in situ* except in such instances as fractures of the patella, where complete removal would not materially interfere with subsequent function. Lavage of the cavity after the completion of excision was a common practice. If employed, a solution of acriflavine (1 in 1,000) was probably the least harmful solution to use. In his opinion primary suture was not justifiable in these injuries, and drainage should be established by means of a light gauze or petroleum jelly pack. He did not think tubes or rubber dams very satisfactory, and no skin sutures, if under tension, should be inserted. The packing of excised wounds with 5 to 15 grammes of sulphanilamide powder was strongly advocated by some American authors. The powder had a local antiseptic value as well as procuring a fairly rapid concentration of the drug in the blood. The method, however, must be regarded as still on trial.

The next step was to reduce the fracture as far as possible, and then to immobilize the parts securely. When there was much overlap of fragments he thought it undesirable to apply heavy traction during the first few days in order to secure reduction. Heavy traction increased the intra-aponeurotic pressure and so reduced the local blood supply at a time when a full one might be vital in combating infection. Avoidance of tension in and around the wound was most important during the period of reaction or early inflammation. For fixation the skeleton splint, as exampled by the Thomas, left wounds accessible and made traction possible. Plaster-of-Paris casing had the great merit of immobilizing the parts completely; access to wounds was not allowed, but, as had been shown by the results of the Winnett-Orr and Trueta methods, this was not a bad thing. He would emphasize, however, that the whole plaster cast, whether padded or not, could be a grave danger when applied to a man to be transported soon after its application. Under these conditions it should be a rule to make a single cut in such plasters right through from end to end and down to the skin and then re-bandage. This was the only way to avoid the disasters which occurred from rigid casings when the patient could not be kept under close observation for a few days after their application. He would not dwell at length on the development of serious infection in these cases as it was too extensive a subject. The early recognition of anaerobic infection was most important and should be based on clinical observation. Prompt surgical intervention was indicated, whether only local or in the form of amputation. Streptococcal infections should not be treated surgically in the acute stage but reliance placed on sulphanilamide. When infection had been avoided or overcome the next care would be to associate the restoration of function in the limb with the period of immobilization necessary for union to occur in the fracture. In times of stress little could be done in France in this direction, but in quieter periods it should not be overlooked. The problem of splintage of individual fractures should be considered in relation to three phases in the wounded man's course: first from the field to C.C.S., secondly at the C.C.S. and during his transit to the base, and thirdly at the base and during his transfer to England. For practically all fractures of the femur the Thomas splint served best when transportation was in view. Even if it was bent at knee level it could be propped up or lashed to the standard suspension bar on the stretcher. From the field to the C.C.S. the clothes and boot should not be removed. The spring heel-clip afforded a satisfactory attachment for traction. If the ring of the splint employed was too large it tended to slip up against the pubes and caused great discomfort. For transport from the C.C.S. under normal conditions he thought that an adhesive traction appliance was the safest. The amount of pull required was not very great at this stage. At the base the case might be retained for some time and the fragments should be aligned as accurately as possible. Traction by pin or wire would be desirable. Generally the tibia would be transfixed just below knee-joint level. He was strongly opposed to transfixion of the lower end of the femur, as he had so often seen the procedure result in permanent limitation in knee movement even when gross infection of the joint had not been present. The splint employed at the base would generally be a Thomas or Braun. The latter, however, was not suited for transport, and would necessitate a change if rapid evacuation became necessary.

Fractures into the knee-joint would be treated in general as fractures of the femur, as outlined above, though he favoured the use of a full plaster case in the later stages. A plaster case which was to fix the knee properly must include the pelvis, and this fact made the method somewhat cumbersome on active service. For fractures of the tibia and fibula, box or wire splinting would be used in the field. At the C.C.S. he considered these injuries were best treated in a plaster case. He preferred to use stockinet as padding, but in all cases emphasized the importance of cutting through the whole case if the man was to be transported soon after application of the cast. Open fractures of these bones, especially when they occurred in the lower third of the leg, would often be best treated by primary amputation. When the posterior neuro-vascular bundle had been torn across and bone injury was severe, there was little doubt it would save a dangerous and prolonged convalescence. Traction through wire or pin was sometimes necessary for missile fractures of tibia and fibula, but not so often as for simple fractures; such treatment would not be applied till the base was reached. He thought there was a tendency to employ traction for fractures of these bones more often and longer than was necessary. Alignment, control of rotation, and good position of the foot were most easily secured by plaster-of-Paris. Fractures of the humerus were comfortably and safely moved from the field to the C.C.S. if the arm were bandaged to the padded side and the forearm supported in a sling. For lower shaft fractures the addition of wire splinting might be desirable, as it was for the forearm. From the C.C.S. to the base, if the fracture was in the upper third of the humerus, similar measures were sufficient. For fracture of the lower section of the shaft he thought plaster slats carried from above the shoulder to the hand were satisfactory. He did not favour the use during transport of any of the splints which exerted pressure in the axillary area. For the C.C.S. treatment of forearm fractures a similar arrangement was often adequate, though a whole cast might be more efficient. The same advice as given above for section of such plasters was urged. At the base no doubt many different appliances for upper extremity fractures could and would be employed. He would say that transportation in the abducted position was seldom satisfactory, and the use of a plaster case in a more normal attitude was most likely to be so.

In his report for 1938 as Director of the Institute for Medical Research, F.M.S., at Kuala Lumpur, Dr. A. Neave Kingsbury states that in the year under review there was only one major emergency to interrupt the planned researches of the various divisions. This resulted from a request by the League of Nations Health Organization for half a million doses of anti-cholera vaccine for use in the China epidemic. Thanks to the efforts of the bacteriological division it was found possible to utilize much local material, and the vaccine was prepared, tested, and dispatched within two and a half months. Malaria takes a prominent place among the diseases investigated by the Institute. Experiments on the chemo-prophylaxis of malaria are recorded; the use of mosquito traps has been advocated for many years past, and the method is now being more and more employed by health authorities; investigations of anti-larval oils have been continued. Progress was made with the nutritional survey, seeking evidence of deficiency of energy-bearing and tissue-building foods and of minerals and vitamins. During 1938 the bacteriological division began an epidemiological inquiry.

Local News

NEW ZEALAND

[FROM OUR CORRESPONDENT IN WELLINGTON]

End of Honorary Staff System

The honorary system of staffing hospitals for so long honourably associated with the voluntary hospitals of Great Britain is now being abolished in New Zealand. Voluntary donations for the upkeep of public hospitals in New Zealand have always been only a minor contribution to the upkeep of hospitals in this Dominion. The main source of revenue has been funds derived from taxpayers through the general Government, local rates, and payments by a proportion of patients for treatment received. Under the Social Security Act the health insurance scheme does not operate in general practice except for maternity benefits through a modified scheme adapted to the recommendations of the British Medical Association. As is fairly well known, the Government's health insurance proposals involved no less than nationalization of the medical profession. However, the Social Security Act does not apply to the hospitals, which receive payment from special taxation under the Act, which supplements and to some extent relieves funds provided by general taxation and rates. Treatment, therefore, in the hospitals is free in the sense that patients make no direct payments. Voluntary medical service is not justified. It is doubtful if it ever was justified in New Zealand, seeing that the public hospitals have never been maintained on a basis comparable with the system of the voluntary hospitals in England. Honorary service for sixty years has been given by the medical profession because of the realization of the fact that hospitals are the doctors' workshop, and that hospital practice and private practice are complementary and beneficial to both in raising the standard of practice. Now a system of paid part-time visiting medical and surgical staffs is being established. The Wellington Hospital, of about 800 beds, may be taken as an example. It has been decided that salaries should be at the rate of £500 per annum for five senior physicians, eight senior surgeons, one obstetrician, and one orthopaedic surgeon, with lower rates for other members of the visiting staff. In addition there are now several whole-time salaried medical officers, and they are gradually increasing in number. The payment for the part-time visiting staff is based upon work for nine hours a week, but it is understood on both sides that these are the minimum hours of work, and the doctors are expected to work as long as their services may be required. It is generally understood that assistant members of the visiting staff will be paid £250 or £300 a year. Socialist members of hospital boards look upon part-time medical staffing as the thin end of the wedge. They favour closed hospitals and are aiming to establish ultimately stipendiary staffs to the exclusion of visiting physicians and surgeons. In any case the honorary system is a thing of the past. It has gone inevitably but not without regret. The increasing tendency to encourage all classes to use the public hospitals has had a detrimental effect on private practice. Private hospitals, however, are very well supported. Patients in private hospitals may, if they so desire, obtain from Social Security funds an amount equal to what would be the cost of their maintenance in public hospitals. Free treatment in public hospitals, in addition, has increased the use of these hospitals, and costly new hospital buildings and additions are being constructed. Hospitals built as cheaply as possible cost about £500 per bed. Permanent hospitals of the highest class with operating theatres and laboratories and other necessities cost £1,500 a bed or more. The Health Department is urging hospital boards to prepare extra wards for the use of wounded and sick soldiers when they return to New Zealand, during and after the war, and soldier out-patients are also to be treated at the public hospitals. Thus a revolutionary change has come and is coming over medical practice. Nearly all cases of road accidents are taken into the hospitals, so that orthopaedic departments are large, and of course open only to those orthopaedic surgeons who are fortunate enough to get appointments on hospital paid visiting staffs.

Military Medical Services

The New Zealand Medical Corps has made a heavy demand on the profession in New Zealand, which has met with a very creditable response. Medical officers will be needed for a Division and reinforcements. Staffing of the various units of the Army—field ambulances, regimental medical officers, and so on—is only part of the necessity. This country is also supplying general hospitals and a convalescent hospital. These hospitals will need, when completed, probably not fewer than a hundred medical officers—a considerable drain upon a profession which does not number much more than a thousand doctors in active practice. The equipment for base hospitals must come mainly from England, for its manufacture is not one of the industries of New Zealand. The British Medical Association in New Zealand is considering a scheme to provide financial help for doctors going on active service. Experience of the last war shows that many of the doctors who return from active service will be severely handicapped and will have rather a lean time trying to re-establish their positions in civil life. As our allies say, with a shrug, *C'est la guerre!*

Correspondence

Treatment of Shock in War Surgery

SIR,—The problem exercising the mind of Dr. G. T. Birdwood (June 1, p. 908) opens up the greater problem concerning the best method of increasing the circulating fluid in currency in cases of traumatic shock. It may be stated that the condition of many patients has been made considerably worse by the injudicious administration of various fluids by the intravenous route. In cases of traumatic shock marked changes have occurred in the walls of the blood capillaries leading to increased permeability, transudation of fluid, and tissue oedema. The use of intravenous isotonic and hypertonic saline and glucose solutions must be guarded, for the fluid soon passes out of circulation through the capillary wall, carrying with it blood protein, so that deleterious effects may be produced. Extensive experiments were carried out by Bayliss on fluid substitutes for blood in cases of haemorrhage and shock, and as a result he recommended the use of a 6 per cent. solution of gum acacia. Since this solution has been used on a large scale much evidence has accrued, consideration of which will lead to the abandonment of the method. If the solution has been improperly prepared severe and fatal reactions have occurred and been reported by W. E. Studdiford (*Surg. Gynec. Obstet.*, 1937, **64**, 772). Deleterious changes have also been noted in the quality and behaviour of the blood after carefully prepared solutions were injected. There is evidence that acacia solution may interfere with the gaseous interchanges in the red blood corpuscles, leading to severe or fatal anoxaemia.

In traumatic shock there is haemoconcentration, and blood transfusion, using whole blood, will increase this factor. Therefore in those cases where there is marked haemoconcentration it appears advisable to administer lyophile serum rather than whole blood, as by this means the blood protein and blood volume are restored without an increase occurring in the viscosity of the blood.—I am, etc.,

London, W.1, June 2. RONALD W. RAVEN.

Organization of Emergency Blood Transfusion Services

SIR,—No one connected with any blood transfusion scheme outside the metropolis could not but endorse fully Dr. S. C. Dyke's observations (June 1, p. 908). Long before the outbreak of war many of us formed a transfusion service capable of meeting the needs of large numbers of casualties, and last September put this service on a war footing despite the vague and lukewarm encouragement of the Ministry of Health.

Personally we have grouped over 1,000 donors from the town and nearly 500 from neighbouring urban and rural areas,

including not a few from the Services. Equipment for dealing rapidly with many donors has been assembled. A team of voluntary workers has on our own initiative been enlisted and trained, but even now we cannot be granted cars for transporting donors, and not even a petrol allowance is obtainable for this purpose. Most of us are only too glad to perform useful national work voluntarily, but we might expect co-operation, if not financial assistance, from official bodies. It seems unreasonable that London should be the sole recipient of official favour, and that the transfusion needs of the rest of the Kingdom should be ignored. This appears to be the general position throughout the provinces, where it seems likely that heavy calls will be made on these services. If these are met successfully it will be due to the unsupported efforts of transfusion officers who have not allowed official apathy to stultify their efforts.—I am, etc.,

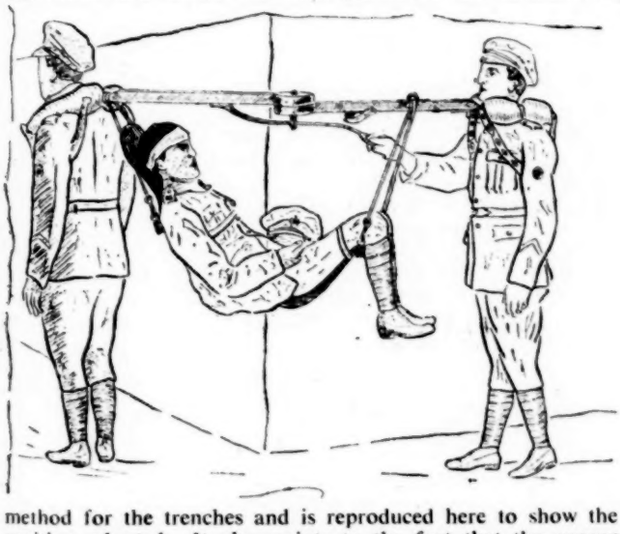
E. BIDDLE,
Transfusion Officer, East Suffolk and Ipswich Hospital.

Ipswich, June 3.

Posture on a Stretcher

SIR,—The article by Dr. W. Reginald Wilson (June 1, p. 895) draws attention to an important matter. It has always appeared to me that we begin in a wrong way when we lay the average wounded man in a horizontal position. The Fowler position is the position of choice, as Dr. Wilson shows, and if this is granted we should try to arrange accordingly. In severe shock the position is not considered the best from a theoretical standpoint, unless the shock is caused by peritonitis. In actual practice the blood pressure adjusts itself with remarkable speed even in severe cases.

Chiefly in connexion with an attempt to design a stretcher for moving a patient in the Fowler position round a right-angled corner in a narrow trench, the matter was thoroughly and practically tested in 1915. The results were published in the *Lancet* of January 22, 1916 (p. 202). The accompanying illustration shows the chief points of the semi-flexible



method for the trenches and is reproduced here to show the position adopted. It also points to the fact that the proper way to support and carry a heavy weight is on the shoulders and not by the arms, as this is tiring in the extreme when long continued. The lower end of a Thomas splint can be elevated to rest on the shoulder of the back bearer. This pattern of stretcher was officially tried the day before the Armistice. As a result it was decided that the shoulder-high suspension was preferable to a waist-high one, previously used. A worm-and-wheel control was designed in place of the lever. This greatly reduced the strain on the back bearer and left both his hands free. A stretcher, with an account of its evolution, was presented to the R.A.M.C. Museum at Millbank, and a proposal to fashion the struts and shoulder-pads (yokes) of pressed steel or duralumin in the future was incorporated in the pamphlet. The older pattern—that is, the one with the lever control—was presented to the Wellcome Museum, and no doubt the parts could be examined in either of these places. The measurements are the results of a long series of trials and would be of value to anyone interested.

The sling is flexible, and is stretched and slung at shoulder and knee so that the patient's chest, neck, head—and in fact the whole length of him—can be turned sideways merely by hitching up one or both suspensions on either side.

It would be an easy matter to make this shape of sling in pressed metal and to substitute it for the flat tray of the regulation pattern stretcher. A locking swivel would enable the sling to be sufficiently rotated on a longitudinal axis to give easy positions for most conditions. Wide webbing straps across the chest and knees make this movement safe when the injuries allow of their use. The tray should be arranged so that the lowest part of the patient—namely, his feet—are some six inches off the ground when the yokes are lowered to the level of the bearers' hands. The poles could be detachable and so allow the tray to be slung in the ambulance, or they could be racked as at present.—I am, etc.,

G. H. COLT.

London, W., June 3.

Evacuation and Invasion

SIR,—The present Emergency Medical Scheme is organized to cope with air raid casualties. What preparations have been made to meet possible invasion and evacuation *en masse*? The lessons of Belgium and France point to the necessity for immediate planning of an "evacuation of movement," and I strongly urge that the Central Medical War Committee appoint area evacuation controllers, experienced in organization for mobile, as opposed to static, casualty collection.

It would be their duty: (1) To reconnoitre the alternative lines and methods of evacuation and suitable sites for dressing and casualty-collecting centres, and prepare a definite and complete plan of operations. (2) In consultation with the Local Medical Committee to arrange for the staffing and equipment of these mobile units by personnel from the area of evacuation, bringing their own transport and their own instruments, etc. (3) Again in consultation, to decide which medical practitioners are to remain in the area invaded. (This is an invidious task, but one which must be faced, as evacuation cannot be complete.) (4) To ensure that these plans are understood and tested, in conjunction with the military and civil defence authorities.

This is not "panic policy," but "preparation for the possible." Do not let us "wait and see," but see first and then wait in confidence.—I am, etc.,

S. RUTHVEN MACKAY.

Runwell, Essex, May 27.

Sustaining Morale

SIR,—Apropos of the broadcast talk recently given by the Minister of Information on the necessity for resisting insidious enemy propaganda designed to undermine the country's morale, it occurs to me that here is a great field in which the general practitioner can give assistance in the course of his day's work. No one is on more intimate terms with the population as a whole in this country than the family doctor, and large numbers of people are visited every day in their homes or seen in the surgery. In the course of such consultations it will not be difficult by judicious remarks and cheering words to help to sustain the morale of patients and their relatives throughout the trying days ahead, and this, if adopted by every doctor with intelligent persistence, will be a great contribution to the national effort.—I am, etc.,

J. B. WRATHALL ROWE.

Harrow, May 28.

Purchasing Power and Food Prices

SIR,—There have recently been references to the necessity for "equality of sacrifice" by all classes to avoid inflation. There are, however, a large number of families already so close to the margin of their physiological needs that further sacrifice might deprive them of the means to satisfy basic needs for food and warmth, and so endanger their health.

No doubt it is assumed that the degree of sacrifice will be graded; and the idea that one family should resign £1 of its weekly income and another only 1s. may appear equitable to the economist. But the physiologist must ask what this shilling represents in terms of a sufficiency of food and warmth. Already the increase in prices has compelled many families to adjust their food habits. Rationing has not been, nor would it be expected to be, effective in preventing this. When a large working-class population is affected by an increase in prices and a shortage of certain foods the protective foods tend to be replaced by cheaper foods deficient in health factors. The disturbance of a country's economic habits by decree may have serious consequences, but the disturbance of a people's food habits may be even more serious. An uncontrollable change in diet necessitated by a fall in purchasing power may lead to severe malnutrition.

It is not enough to say that the worst cases of destitution will be relieved. We are dealing with a complex series of changes. We might cope with rationing alone, with a rise in prices alone, or with a fall in income in many working-class homes alone, but when all three happen together and at varying accelerations it is difficult to estimate the result in terms of working-class diets. We may be only at the initial stages of profound changes in purchasing power and food prices. It is of the utmost importance that measures should be taken now to ensure that the ratio of purchasing power to retail food prices be adjusted so that there need be no deterioration in the diet of the wage-earner.—We are, etc.,

For the Children's Nutrition Council,

F. GOWLAND HOPKINS, *President*.

SIDNEY M. BERRY,
JANET M. CAMPBELL,
A. D. HALL,
HORDER,
JULIAN S. HUXLEY,
R. MCCARRISON,
V. H. MOTTRAM,
NOEL-BUXTON,
J. B. ORR,
C. S. ORWIN,
GERTRUDE M. TUCKWELL,
Vice-Presidents.

ELEANOR F. RATHBONE, *Chairman, Executive Committee*.

EVA M. HUBBACK, L. HADEN GUEST, *Vice-Chairmen*.

Bread

SIR,—I was much interested to read Mr. A. Rugg-Gunn's letter (May 25, p. 870). It so happens that the original Clark milling process is in operation within a mile of the hospital of which I am in charge. Some six years ago, when wishing to introduce wholemeal bread into the hospital dietary, I happened to hear of the process and was able to inspect in detail the whole milling plant and see it in operation. I can confirm all Mr. Rugg-Gunn's remarks, but would like to add that the wheat germ is included in the flour, and with all the other constituents is reduced to a very fine size. The flour has been used in the hospital bakehouse for making bread ever since. Patients and staff alike have found the bread pleasant and digestible, and even old persons and patients on special gastric diets have used the bread without any complaint of intestinal irritation.

Genuine wholemeal flours are not readily obtainable, and it is not widely appreciated by the profession or the public that most brown bread sold is not wholemeal. Actually, the ordinary large millers' plant cannot produce wholemeal flour, and most firms do not find it a paying proposition to put in special plant. The value of wholemeal bread is, I believe, beyond dispute, hence the interest attached to special milling processes.—I am, etc.,

Health Department, Hull,
May 29.

D. V. MARSHALL,
Medical Officer.

Private Practitioner as Propagandist

SIR,—Your commendation of Dr. Griffith Evans's effort (June 1, p. 899) to engage the activities and opportunities of the individual private practitioner in the enterprise of spreading among his patients knowledge having value in the promotion of health and the prevention of disease may find a particular endorsement in a resolution recently issued by the Royal College of Physicians. The relevant part of the resolution, which is headed "Safe Milk," reads:

> "In the opinion of the College members of the medical profession might usefully advise parents and guardians of children of the risks of infection which attend the consumption of raw milk, and of the value of pasteurization, or alternatively of boiling the milk, in removing these risks." (*Journal*, May 11, p. 788.)

The object, of course, is to secure a milk supply safe from the risks of tuberculosis and other infections. The attempt to gain this end by legislation has failed, and in the meantime the public is offered milk bearing such alluring names as "clean," "pure," "standard," "accredited," and the rest, though none of these labels carries a guarantee of "safety." What is required is an educated demand for "safe" milk, and the creation of this demand may, as the Royal College suggests, be effected by the voice and action of the individual private practitioner. Medicine will thus discharge a responsibility which falls upon the profession as protector of the public health.—I am, etc.,

London, June 1. C. O. HAWTHORNE.

Treatment of Drowning and Electrocution

SIR,—I am very grateful for the suggestions from your various correspondents dealing with the treatment of drowning and electrocution and the methods of carrying out artificial respiration, and also to the many medical men who have written to me privately. There are only two points upon which I would like to comment.

First, I stressed in my article the real importance of regarding the victims of drowning and electrocution as being in a state of suspended animation, and the entirely fallacious nature of the positive signs of life in such cases—such as pulse, heart sounds, respiration, and corneal reflex; and at the same time the necessity for not abandoning artificial respiration until positive signs of death appeared—such as rigor mortis, cooling of the body, or post-mortem staining. The need for a reorientation of opinion in such matters still exists.

In a recent brief report in the Press of a case of electrocution from contact with a faulty electric petrol pump appeared the comment, "Death was instantaneous." This is practically never the case in electrical accidents and certainly never the case in drowning, although apparent death is a frequent result. In the case of drowning popular misconceptions as to the intrinsic importance of the time of immersion alone often delay or paralyse efforts directed towards recovery. Some patients may be killed outright after a very short period of immersion; others again, as recent reports show, may survive much longer periods, even up to half an hour, and still respond to artificial respiration. The practical deduction to be drawn from these observations is that every case of apparent death from drowning or electrocution must be given the benefit of the doubt until such time as positive and conclusive signs of death appear. The knowledge that this is the case may be of very real value in the critical times through which we are passing at present.

Secondly, with regard to the exact method of artificial respiration which is to be employed. In my article I deliberately avoided all academic or lengthy discussion of the merits of the various methods. Because a classical method of resuscitation was described many years ago by its originator it does not follow that with time modifications may not be necessary in the light of physiological advances and further research work. And I certainly agree that the time is ripe for a review of established practice in this connexion. Meanwhile the important point is that in cases where artificial respiration is called for it should be immediate, prolonged, and persistent. If this is not the case then the exact method of carrying out artificial respiration becomes largely of theoretical and secondary importance.

Much of the recent work in connexion with artificial respiration in drowning comes from Canada, and the paper I quoted by Bates, Gaby, and Maclachlan in the *Canadian Medical Association Journal* (1938, **39**, 120) represents the present position of the subject. These writers are members of the Committee on Artificial Respiration of the Health League of Canada, and they have concentrated on the problems of artificial respiration in the light of recent knowledge. Other important papers dealing with physiological studies in experimental drowning have appeared by Banting and others. Many advances have been made since the classical methods of carrying out artificial respiration were introduced. At the same time, from the practical point of view, little is likely to be gained by alterations or modifications of methods of artificial respiration without a reorientation of the current attitude towards the apparently dead from drowning and electrocution. Technical improvements in methods of artificial respiration will certainly be offset by an attitude of mind which says, "He cannot be alive: he has been immersed in water ten, fifteen, or thirty minutes," or, "He cannot be alive because the electrical current was 200, 1,000, or 10,000 volts," etc. This attitude of mind must be eradicated, as it will certainly conduce to more deaths than the lives likely to be saved by any possible modifications of methods of carrying out artificial respiration.—I am, etc.,

London, W.1, May 31. REGINALD T. PAYNE, M.S., M.D., F.R.C.S.

Artificial Respiration

SIR,—If Dr. Pasmore (May 25, p. 867) will but try my method of applying artificial respiration he will find that there is no difficulty whatever in making the ulnar border of the hand correspond with the line of the last rib, that it is the most comfortable position for the operator, and that the movements cause surprisingly little fatigue.

The idea that the prone method causes respiratory exchange by compression of the abdominal viscera is a vain superstition. The prone body is supported on a tripod of which the anterior leg is provided by the breastbone and the two posterior legs are the knees. The anterior superior iliac spines and the pubes are a little less than a fingerbreadth from the floor. Pressure applied to the loins brings the spines and pubes into contact with the ground, and they then tenderly protect the abdominal contents from further compression. The expiratory movement in the prone method is not produced by abdominal compression but by approximating the breastbone more nearly to the ribs and by increasing thereby the obliquity of the ribs—a normal expiratory movement, and the leverage for this can best be applied by the method described by Mr. Payne.

Can anyone tell me of any advantage in keeping the thumbs close together? It is certainly painful and fatiguing.—I am, etc.,

London, W., May 27. THOMAS E. A. STOWELL.

SIR,—Having read Mr. Reginald Payne's article, I would like to point out the value of listening to and for the current of air in the throat of the subject of the experiment. If nothing is heard, the movements being carried out are entirely futile. Either there is an obstruction, or the movements are faulty in themselves. Furthermore, I suggest that the best technique is presumably that which, under observation, produces the strongest current, barring, of course, rough handling, and undue fatigue to the performer. In view of the fact that every doctor listens in this way while giving an inhaled anaesthetic, it is truly extraordinary that there seems to be no reference to the principle in ambulance textbooks.—I am, etc.,

Doncaster, May 27. W. REGINALD WILSON.

Perforated Jejunal Ulcer after Gastrectomy

SIR,—Mr. W. A. Law describes (May 25, p. 844) two cases of jejunal perforation after gastrectomy for duodenal ulceration. He gives good records of both cases, including descriptions of the original gastrectomies, with particular reference to the scope of the operation in the upward direction. As usual in these cases, no special note is made of the lower level of the gastrectomy. Without consulting records, I also can recall two cases of acute perforation after gastrectomy for duodenal ulcer. The first of these patients perforated, was repaired, and recovered, to re-perforate some months later, and he finally died after drainage of a subphrenic abscess. The second patient made a good recovery and has remained in excellent health since the emergency operation, at which I not only closed the perforation but also removed a small remnant of stomach at the excluded pyloric end.

Mr. Law advocates for the relief of these cases a further resection of the stomach at a high level to diminish the acid-secreting mucosa. In my own experience this operation does no good, and I make a guess that it may do positive harm by reducing the dilution of the acid secreted. On the other hand, I have repeatedly seen dramatic improvement follow the removal of the excluded pyloric end. When the duodenum is scarred its division and closure is difficult and even dangerous, and one may elect to cut across the juxtapyloric portion of the stomach. If this is done a high percentage of recurrent ulceration is inevitable, the gastrin produced by the small remnant of pylorus being sufficient to maintain a high level of acidity in the fundus. Since, however, the importance of this step is (*ex hypothesi*) not recognized at the time of operation, no note is made by which these patients can be identified. I suspect that this group of cases accounts for most of the failures of gastrectomy in duodenal ulcer. Secondary pylorectomy is well worth doing. At the secondary operation the ulcer itself should, in my opinion, not be disturbed and a more radical gastrectomy should not be attempted.—I am, etc.,

Liverpool, June 1. CHARLES WELLS.

Vaccination Site

SIR,—The site for vaccination recommended by Dr. W. L. James (June 1, p. 891) seems to be very similar to, if not identical with, that suggested forty years ago by Dr. I. H. Goldberger of New York (*N. Y. med. J.*, 1920, **112**, 1035), to whose paper I have drawn attention in my work on *Acute Infectious Diseases*, as well as in the *Medical Annual*, 1922, p. 494. From my own experience of Goldberger's method I can fully confirm what Dr. James says as to the advantages of the site recommended.—I am, etc.,

London, W.8, May 31. J. D. ROLLESTON.

Method of Vaccination

SIR,—The note by Dr. W. L. James upon the scars caused by the scarification method of vaccination (June 1, p. 891) prompts me to recall a method of vaccination which is not so well known as it deserves to be—the "multiple pressure" method. This consists of a shallow tangential pricking of the skin with a sterile needle through a drop of calf lymph.

A sharp straight surgical needle is held crosswise to the arm and parallel or tangential to the skin. The side of the needle point is then pressed firmly and rapidly on to the skin through a drop of lymph about thirty times within five seconds, the needle being lifted clear of the skin each time. The motion of the needle should be perpendicular to the skin surface, and not at all in the direction of the long axis of the needle. The point is not driven into the skin, but at each pressure a minute fold of epidermis bulges over the point of the needle and is lightly nicked, so that the lymph is carried into the deeper layers of the epidermis. It is important that the area of insertion should not be greater than 3 mm. (1/8 inch) in diameter. There should be no trace of bleeding, and all evidence of vaccination will fade out in less than six hours. The entire process may be summarized as follows: (1) Cleanse the skin with ether or other volatile antiseptic. (2) Place a drop of lymph on the cleaned area. (3) Vaccinate by the multiple pressure method. (4) Immediately wipe the remaining lymph off the skin with dry gauze. A dressing is usually unnecessary and undesirable, but tight clothing and moisture from bathing or perspiration should be avoided.

If necessary, to avoid soiling the clothing a fold of sterile gauze may be attached to the inside of the sleeve.

This method of vaccination has many advantages. It is painless. It is more rapid than any other safe and effectual method. The absence of trauma renders a control site unnecessary. If the method is properly carried out the resulting scar is smooth and inconspicuous—in fact, unnoticeable to casual observation. It should be noted that the arm is much to be preferred to the leg as a site for vaccination. The poorer blood supply of the skin of the leg renders severe local reactions more likely, and secondary infection occurs more readily.—I am, etc.,

W. T. AGAR, M.B., B.S.

University Laboratory of Physiology,
Oxford, June 3.

Treatment of Early Syphilis

SIR,—To relieve the anxiety expressed by Surgeon Lieutenant-Commander S. J. Wheeler (May 25, p. 871) about the consequences of my method of treatment of primary and secondary syphilis, may I say that an effective follow-up system prevails in Liverpool, and after sixteen years I have to report that no case treated by me has entered a municipal hospital suffering from the late effects of syphilis, and no death from syphilis registered in this city has occurred among cases so treated.

My contention is that the interval between individual doses of neo-arsphenamine should not be greater than four days, and provided that bismuth is given concurrently a relatively low total dosage of both drugs will give results which, for want of a better name, I call "cure," but which to date can be stated thus: Blood Wassermann and Meinicke tests always revert to "negative" within three months after the administration of 4.5 grammes neo-arsphenamine and 2 grammes bismuth. No serological relapse has occurred provided three such courses have been given. No clinical relapse has occurred. Cerebrospinal fluid examinations done in the fifth year after infection have always proved normal. No patient has died or entered a municipal hospital as a result of syphilis, in spite of active steps to collect such data.

In conclusion, the interval between courses could be shortened to one month if desired, but of the effects of this I cannot speak, since I have been interested in the "Wassermannotrophic" effects of one course. This is absolute three months after the end of one course.—I am, etc.,

Liverpool, May 31. A. O. F. ROSS.

Plaster Treatment

SIR,—Can anyone say how zinc oxide plaster can be sterilized without losing its adhesive properties? The reason I ask is this. At least three out of every four skin wounds met with in general practice can be more neatly apposed by strips of plaster than by sutures or clips. The plaster, in suitable width, takes a broader hold of the skin than a stitch, and it can be used in sufficient length to get a good grip of the skin and to pull the skin and underlying tissues firmly together in compression, rather than by tension on tiny spots of skin. The result is a pleasant absence of sagging between the strips. It is much less trouble than sutures or even than clips; much less trauma is caused at the time, no stitch-marks remain after healing; and, what is by no means a minor point, it is infinitely less painful to the patient. Mechanically it is a much better job. The snag is the risk of infection from the plaster, and if anyone can tell me how to prevent this risk I shall be grateful.

While on the subject of plaster, I wonder whether the advocates of the occlusive treatment of varicose ulcers remember how ancient the method really is. Over fifty years ago my principal used to treat these bad legs successfully by strapping them with strips of the old-fashioned "infirmary plaster" on brown holland, bound round the leg, overlapping each other, with the ends firmly crossed over the ulcer. Unfortunately, recurrences were as common then as they are now.—I am, etc.,

Leigh, Lancs, June 1. JOSEPH JONES, M.D.

Influenza

SIR,—The subject of the "changing face of influenza" can best be settled by a reference to publications on that subject in the last century. If we compare the accounts written in those days with those written in the present day we can perhaps arrive at some conclusions. I have just read through the account of influenza in Sir Thomas Watson's *Lectures on Physic*, and in 1871 he writes an account of the disease in 1837. I have also read the account in my father's work *The Theory and Practice of Medicine* (published in 1876) of the epidemic in the 'fifties. The accounts in both these works present a picture differing but little, if at all, from the epidemics of recent years. When this disease remade its appearance in 1888 I had under my care a large school. You published an account of this outbreak at the time, and here again there was very little difference, beyond the severity of the cases, from the outbreaks of the present day.—I am, etc.,

Clifton, Bristol, May 27. HUBERT C. BRISTOWE, M.D.

Obituary

MATTHEW YOUNG, M.D., D.Sc., D.P.H.

Lecturer in Anatomy, University College, and Member of Research Staff, Medical Research Council

The death of Dr. Matthew Young, which took place on May 25, at the age of 56, after a long illness patiently borne, is a great loss to anatomy, anthropology, and biometric science. He is an outstanding example of the man of first-class ability, interested and competent in a much wider field of knowledge than his own special subject, whose true worth, despite valuable contributions to science, is in danger of being overlooked because of innate modesty and an inveterate disposition to place his exceptional gifts at the service of others.

After an academic career of great distinction, Dr. Young graduated M.B., Ch.B. with honours at Glasgow in 1907, *proxime accessit* to the Brunton Memorialist of his year, and was trained as an anatomist by John Cleland, whose senior medallist and junior demonstrator he was, and by T. H. Bryce, as his senior assistant for six years. In 1915, after receiving a gold medal, with the Struthers gold medal and prize, for his M.D. thesis on "The Scottish Skull," a work in which his analytical powers were first displayed, Dr. Young wished to join the R.A.M.C., but was persuaded, instead, by the late Dr. John Brownlee to work with him under the Medical Research Committee on the compilation and analysis of the medical records of the four years' war. Apart from invaluable data on the results of new surgical procedures, passed back from time to time to the surgeons in the theatres of war, the historical and practical value of Dr. Brownlee's project was very great. The Ministry of Pensions finally took over about one-and-a-quarter million medical case sheets and a card-index containing upwards of twenty-two million cards in such a condition that it was possible to produce within half a minute a summary of the complete medical history of any officer or soldier ever admitted to a hospital, including casualty clearing stations, during the war. The late Sir Walter Fletcher publicly acknowledged the great value of the united labours of these two Glasgow men, and mentioned that, incidentally, they had probably saved the country some millions of pounds by providing a complete check on claims to pensions. This colossal task, which gave full scope to Dr. Young's analytical powers and patient

industry and occupied him during and for some years after the war, led to his temporary divorce from anatomy, and doubtless also confirmed his analytical outlook on anatomical problems. But it was certainly his loyalty to Dr. Brownlee, and not any desire to become a "mere statistician," that induced him to accept in 1922 an appointment on the permanent research staff of the Medical Research Council for work in Dr. Brownlee's Department at the Hampstead Institute, and to remain there until Dr. Brownlee's death in 1927.

In 1917 Dr. Young had taken the D.P.H. of Cambridge University, and between 1920 and 1927 he published a series of statistical papers, some twenty in number, including studies in epidemiology and on the incidence and mortality of cancer. In 1928 he achieved his desire to return to anatomy and anthropology, when a special arrangement was made that he should work in Elliot Smith's department at University College, holding the post of lecturer in anatomy there but retaining his position on the research staff of the Medical Research Council. This combination suited him very well, and thus began the most fruitful and happy period of his scientific work, troubled only by the gradual advance of the insidious malady, cheerfully concealed and scarcely allowed to interfere with his labours, which has now brought them to an untimely end. During this period Dr. Young took an active share in the teaching of anatomy in all its departments, including physical anthropology, at University College, a return to direct contact with the academic side of his own subject that gave him quiet satisfaction. The scope of his interests and of the researches which he now steadily pursued is indicated by the facts that in addition to membership of the Anatomical and Pathological Societies he was a Fellow of the Royal Anthropological Institute and of the Royal Statistical Society, and that he was invited to join the Statistical and the Dental Diseases Committees of the Medical Research Council. More than half of the numerous papers he published from University College were of joint-authorship, and it is safe to say that many of them would never have seen the light, or at least that the data they presented would have lost most of their value, had Dr. Young not brought to bear on them his complete mastery of biometric methods of analysis.

The problem of facial growth with reference to the development of the dentitions attracted him greatly. A short study of dental characters in twins (with Miss H. Bachrach) was followed in 1932 by his first contribution to the Special Report Series of the Medical Research Council (No. 171)—on "facial growth in children with special reference to dentition" (with Miss K. C. Smyth). His share of this work (with other scientific papers) gained for him the D.Sc. of the University of Edinburgh, and in the same year he published with Professor Turnbull their analysis of the data collected by the Status Lymphaticus Committee of the Pathological Society. In addition to several other papers on dental problems, including the Medical Research Council Special Report No. 225 (1937) on post-normal occlusion (with Miss K. C. Smyth and others) and craniological studies in *Biometrika* on the West Scottish skull, the Dunstable skulls, and on two of the largest collections of authentic Anglo-Saxon skulls yet described (Bidford-on-Avon and Burwell), special mention must be made of the willing assistance Dr. Young freely gave in a variety of other investigations. Outstanding in this respect was his contribution to Mrs. May (now Lady) Mellanby's great work on diet and the teeth (M.R.C. Special Reports), Part III of which, as also the report on the special Birmingham investigation, owed much, as the author acknowledged, to Dr. Young's careful biometrical analysis of the factors concerned and his interpretation of their statistical significance. He also undertook valuable field and clinical investigations for Sir John Orr's Committee on Iodine Deficiency and Thyroid Diseases, and collaborated with Sir Grafton Elliot Smith on the affinities of the cranial fragment known as the London skull ("Lady of Lloyds"); and meanwhile he was diligently collecting material and making observations for studies of spinal curvature and posture, body build and predisposition to disease, intimate structure of cerebral cortex in relation to unilateral functional areas, and various aspects of the growth of the face and jaws. His last paper on the last subject, his favourite one, was read jointly at the International Congress of Anthropology and Ethnology in 1934, for which he also acted as Secretary of the Physical Anthropology Section.

Dr. Matthew Young's great generosity in helping others who lacked his special knowledge and equipment has already been emphasized. The quiet exercise of great talents by a man of gentle, modest, and cheerful character, who bore the while his own cross of a malady whose nature he knew but too well, has long been the admiration of those who had the privilege of his friendship. While mourning his loss and sympathizing deeply with his wife and family, those friends cannot but feel pride in reflecting that no man ever better earned the reward of such as he: "Well done, thou good and faithful servant."

J. C. B.

Professor John Kirk writes:

It was my privilege to be closely associated with Matthew Young as a fellow worker in the Department of Anatomy at University College, London, from 1928 to 1937, and I would like to pay a tribute to his memory.

It was a happy arrangement which gave University College the services of so able a teacher and investigator, while at the same time he continued his activities as a member of the research staff of the Medical Research Council. Although biometrical statistics was the science in which he was *facile princeps*, anatomy was his first love, and generations of medical and science students will gratefully remember him as a lucid and stimulating teacher in physical anthropology as well as in human anatomy. Those of us who were privileged to be his colleagues will cherish the memory of his winsome and gracious personality. Exactitude and honesty of purpose were his native air. The way in which he could sum up the evidence for and against some debated theory of anthropometric reconstruction was so precise, and shrewd withal, that we knew we were listening to the last word. Men like Matthew Young are rare, and this country is fortunate in possessing the fruits of his labours and the example of his unobtrusive and single-hearted devotion to truth.

SIR JOSEPH LEECH, M.P.

M.D., M.S., F.R.C.S.Ed.

Sir Joseph William Leech, M.P. for the West Division of Newcastle-upon-Tyne, died suddenly on May 30 after attending a meeting. Born in 1865, he was educated for the medical profession at Newcastle, graduating M.B., B.S. of the University of Durham in 1887, M.D. in 1896, and M.S. in 1902. He obtained the F.R.C.S.Ed. in 1900 and was awarded the honorary degree of D.Ch. by Durham in 1934. He was for many years surgeon to the Royal Victoria Infirmary and to the Throat and Ear Hospital, Newcastle, and had been lecturer and examiner in clinical surgery at the University of Durham College of Medicine. Sir Joseph Leech was a past president of the University of Durham Medical Graduates' Association and of the Newcastle Clinical Society, and a Fellow of the Association of Surgeons of Great Britain. During the last war he was attached to the 1st Northern General Hospital with the rank of major, R.A.M.C.(T.). He was Sheriff of Newcastle-upon-Tyne in 1930–1, and Lord Mayor in the following year. He received the honour of knighthood in 1938, having then been a Member of Parliament for seven years. Sir Joseph Leech was a leading figure in the Northern group of National Government M.P.s who devoted themselves to the welfare of their area both in this Parliament and in its predecessor. He also took an active part in all Parliamentary discussions on the reorganization of the University of Durham

MR. CHARLES FREDERIC MARSHALL, M.D., F.R.C.S., who died on May 22 at Golders Green, N.W., was the joint author with E. G. Ffrench of *Syphilis and Venereal Diseases*, which reached its fourth edition in 1920, and of a small book, *Syphilis and Gonorrhoea*, published in 1906. He was born in Birmingham in 1864, and studied at Owens College and the Victoria University of Manchester, taking the B.Sc. degree in 1883, the M.Sc. in 1886, the M.B., Ch.B. in 1889, and the M.D. in 1890. After being admitted a Fellow of the Royal College of Surgeons of England in 1893 he held for a year the post of surgical registrar at the Hospital for Sick Children, Great Ormond Street, and was for six years assistant surgeon to the Hospital for Diseases of the Skin, Blackfriars. During the last war and for two years after the armistice he was a civilian medical officer attached to the R.A.M.C. He had been a member of the British Medical Association from 1895 until his retirement at the end of 1937.

The death of Dr. G. P. HUMPHRY, of Abergavenny, was recorded in the *Journal* of May 25, p. 875. Mr. Victor Bonney sends the following appreciation: Gilbert Percy Humphry's father was a medical man who practised at Wisborough Green, Sussex, and afterwards at Chichester. Gilbert received his medical education at St. George's Hospital, and during 1914–18 was captain R.A.M.C. and served in Mesopotamia. After the war he settled at Abergavenny, where his ability, kindness of heart, and engaging manner speedily brought him many friends and patients. His premature death deprives the profession of a gifted practitioner and his friends of a good sportsman and a singularly lovable character. He married Kathleen Rees of Pendarren Park, Crickhowel, who, with two daughters, has the deep sympathy of all who were privileged to know him.

The following well-known foreign medical men have died: Dr. LOUIS DARTIGUES, one of the most brilliant Paris surgeons, a pupil of Pozzi, and author of works on general, obstetrical, and plastic surgery and endocrinology, aged 71; Dr. NIKOLAI POPOFF, late professor of psychiatry at Sofia, and previously professor of psychiatry at Warsaw, Kazan, and Odessa, aged 82; Dr. INGELRANS, professor of general pathology at the Lille faculty of medicine; and Dr. EUGÈNE CHARLES APERT, a Paris paediatrist, aged 71.

The Services

R.N.V.R. OFFICERS' DECORATION

The King has approved the award of the Royal Naval Volunteer Reserve Officers' Decoration to Surgeon Commander Edward Emile Delisle Gray, R.N.V.R.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

The name of Surgeon Lieutenant JOHN WADE RHYS, R.N., is included in the Admiralty's list of casualties which occurred when H.M.S. *Glowworm* was sunk on April 8, under the heading "Missing, Presumed Dead." Dr. Rhys qualified M.R.C.S., L.R.C.P. in 1934, and had been a member of the British Medical Association for three years. He entered the Royal Navy on May 20, 1934.

In an Admiralty casualty list published on June 3 the name of Temporary Surgeon Lieutenant NORMAN JAMES HAGGAR, R.N.V.R., is included among the "Missing, Believed Killed." Dr. Haggar received his medical education at the Middlesex Hospital and qualified M.R.C.S., L.R.C.P. in 1938. After holding the post of resident medical officer at the Beckenham Hospital he was appointed assistant medical officer at the Bucks County Mental Hospital, Stone, Aylesbury, a position he held until the outbreak of war. He had been a member of the British Medical Association since January, 1939.

ROYAL ARMY MEDICAL CORPS

In Casualty List No. 7, issued by the Army Council, Lieutenant AVELING DONALD AVELING, R.A.M.C., is posted as "Missing."

Captain JAMES KENNETH SUTHERLAND, R.A.M.C., has died of wounds. He was born at Brynmawr, Wales, in 1910, was educated at Taunton School and studied medicine at the University of Edinburgh, where he graduated M.B., Ch.B., with distinction, in 1934. He then held house appointments at the Royal Infirmary, Edinburgh, the Simpson Memorial Maternity Hospital, and the Astley Ainslie Institution in Edinburgh. After serving as resident obstetrical officer at the Simpson Memorial Maternity Hospital he was appointed first assistant in obstetrics and gynaecology at the British Postgraduate Medical School. He was in the Territorial Army, and was therefore called up in September, 1939. He added the diploma of M.R.C.P.Ed. in 1936 and obtained that of M.R.C.O.G. in 1939. He married Joan Kennedy Cunningham, who graduated M.B., Ch.B.Ed. in 1937. He joined the British Medical Association immediately after qualification.

DEATHS IN THE SERVICES

Major GEORGE BLAKELEY RUSSELL, R.A.M.C. (ret.) died at Instow, North Devon, on May 19, aged 79. He was born on July 3, 1860, and was educated at Trinity College, Dublin, where he graduated M.B., B.Ch. in 1882, winning the University travelling scholarship in that year. Entering the Army as surgeon on August 2, 1884, he became major after twelve years' service and retired in 1904, on completion of twenty years' service. After retirement he was employed at Netheravon, Wiltshire, in 1912–13. He rejoined for service on August 5, 1914, and served throughout the war of 1914–18. After its close he was employed as deputy commissioner in the Ministry of Pensions from 1918 to 1927. He served in the Sudan campaign of 1885, at Suakin (Egyptian medal, with clasp, and Khedive's bronze star); and in Burma in 1891–2, in the Irrawaddy and North-Eastern columns (Indian Frontier medal, with clasp).

Universities and Colleges

UNIVERSITY OF OXFORD

At a Congregation held on June 1 the following medical degrees were conferred:

D.M.—R. C. MacKeith, J. W. A. Turner, C. F. Hamilton-Turner, *F. E. Buckland.

* In absence.

UNIVERSITY OF CAMBRIDGE

Dr. W. L. H. Duckworth has been elected Master of Jesus College in succession to the late Mr. Arthur Gray. In recent years Dr. Duckworth has been President, Bursar, and Steward of the College, and was elected a Fellow in 1893. He graduated M.A. in 1896, M.D. in 1905, and Sc.D. in 1906. He was University Lecturer in Physical Anthropology 1898 to 1920, and represented the University on the General Medical Council 1923–6.

UNIVERSITY OF LONDON

LONDON HOSPITAL MEDICAL COLLEGE

The College Board has awarded the following entrance scholarships for the forthcoming academic year: *Price Entrance Scholarship in Science* (value £100): W. O. Backus (Kingswood School); *Open University Scholarships* (each of the value of £100): E. H. Back (Clare College, Cambridge), J. R. Robson (Emmanuel College, Cambridge).

UNIVERSITY OF LEEDS

On May 28 the Leeds University Court had before it proposed changes in the courses of study for degrees in medicine and surgery and in dental surgery. The proposals sought in effect to lengthen the course for the M.B., Ch.B. by one term to a period of six years, and to lengthen the course for the B.Ch.D. by six months to occupy five full years. Professor J. H. Priestley, submitting the proposals on behalf of the Senate, said that the working of the present regulations for the medical course was thoroughly unsatisfactory; there was much overlapping in subjects, and only 40 per cent. of the students qualified in the minimum period. The head master of Leeds Grammar School opposed the changes on the ground that they would tend to debar from the medical profession the sons and daughters of the middle and working classes. Sir Bernard Lomas-Walker, chairman of the West Riding County Council, holding that this was not the time to lengthen the medical course, said that whether the war was short or long there would be a great need of doctors, and a doctor qualified in the shorter period would be better than no doctor at all; he agreed that

the expansion of the medical and dental courses would also bear heavily on the parents of some students. The Court resolved by a majority of seventeen votes to four to refer the proposals to a special committee for further consideration.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examinations indicated:

DIPLOMA IN TROPICAL MEDICINE.—C. W. Hossack, I. Kitchlew, T.-L. Tan.

DIPLOMA IN TROPICAL HYGIENE.—M. P. Browne, E. S. Dismorr, Frances Dooley, J. M. French, D. B. George, M. H. Hafezi, Rebecca Koshi, I. H. Marrable, J. D. Munroe, I. Soorani, H. Stott.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

SURGERY.—C. Cotterill, N. P. Desai, B. Gallivan, A. G. Hick, F. G. Pattrick.

MEDICINE.—C. Cotterill, A. G. Hick, D. S. Edwards, G. G. France, K. W. N. Palmer, W. E. Whaite.

FORENSIC MEDICINE.—C. Cotterill, A. G. Hick, D. S. Edwards, G. G. France, K. W. N. Palmer.

MIDWIFERY.—C. Cotterill, A. G. Hick, R. G. Feast, C. H. Wood.

The diploma of the Society has been granted to C. Cotterill, N. P. Desai, D. S. Edwards, R. G. Feast, G. G. France, and A. G. Hick.

Medical Notes in Parliament

Moving the second reading of the Finance Bill on May 29 Sir KINGSLEY WOOD said that since Lord Simon had introduced the Budget the situation had changed and there would be a greater expenditure upon the war. It would be necessary to increase the taxes further in the near future, after a short period in which the country could adjust itself to the burdens already placed upon it. There was nothing in the new powers of the Government which endangered money in any bank or savings in any way. The Bill was read a second time.

Colonial Welfare

During the debate on the second reading of the Colonial Development and Welfare Bill on May 21, Dr. HADEN GUEST said that the Bill contained a plan for setting aside £5,000,000 a year and £500,000 for research. That plan was admirable in itself, but, he asked, on what were they going to spend the money? He was perturbed when the Minister of Health made it clear that the total amount of money might not be spent.

Sir FRANCIS FREMANTLE urged the need for care in seeing that in education money was spent on a proper and reasonable scheme. They had to consider the psychology of the people, their minds and needs, to see in what way they wanted their children educated. He referred to the work of the British Empire Leprosy Relief Association, which had been established for about fifteen years and had branches all over the Empire. By that scheme they had obtained knowledge of the extent of leprosy throughout the world, and had found that it was at least two or three times as prevalent as had been supposed. Formerly the treatment was entirely insufficient. The leper was a pariah, cut off from civilization. Modern methods and discoveries had shown that probably two-thirds of these cases were no longer contagious or infectious and that they could be returned to ordinary life. Clinics had been established, with the result that people came forward in the early stages, and though the number of known lepers throughout the Empire had been increased by two or three times splendid results were obtained from the treatment afforded. Surveys which had been made in different colonies and possessions showed that, now that we had a rational scheme for the treatment of leprosy, the natives rose to it. In Zululand they were struggling along with small hospitals containing about twenty beds and having financial resources of £400 a year. He hoped that the grants to be made under the Bill would be given to small hospitals of that sort in different parts of the colonies where they could not afford to keep them going or extend and improve them with their present resources. Zulu girls were being trained as midwives, and one little hospital was training and sending out about a dozen in a year. A special effort should be made under this Bill to provide facilities for training native people in the work which they could do in the health services. One of the first essentials was to train midwives, but it was necessary to train other workers. They would want to train doctors when they got to the stage of establishing voluntary medical schools, but what was very necessary now was the training of people for subordinate services as auxiliaries, to help as dressers, laboratory attendants, sanitary inspectors, and so on.

Medical Women in the Army

On May 28 Mr. LAW, replying to Dr. Summerskill, said it was not considered necessary to appoint women specialists in the medical service of the Army for the specific duty of treating women auxiliaries in addition to the specialists already available. Women doctors employed in the Army were eligible for specialist appointments.

Dr. SUMMERSKILL asked why there was this discrimination against women. Mr. LAW said he did not think there was any discrimination against women as such. It was the purpose of the authorities to get the best available medical attendance for members of the Forces, irrespective of sex. Dr. SUMMERSKILL asked if there was in the Army any prejudice against women. Mr. LAW: I am sure there is no such prejudice.

Services of Foreign Doctors

On May 28 Mr. GROVES asked the Home Secretary if he would favourably consider imposing a condition in respect of those alien doctors of enemy nationality, including refugees, who had been and might be permitted to practise in Great Britain, that, when within the age groups of British subjects compulsorily called up for service, the continuance of their permit was contingent on their undertaking some form of national service and upon their not practising to the prejudice of the absentee British doctors.

Sir JOHN ANDERSON said he had no doubt that the majority, if not all, of the foreign doctors would be willing to undertake some form of national service in their own profession, but his information was that the medical profession would not look with favour on this proposal. In pursuance of the Emergency Powers (Defence) Act, 1940, these foreign doctors, like other people, might be required to place their services at the disposal of His Majesty, and there would be power to utilize their services in any way which might be found appropriate in the national interest.

Nutritive Value of Bread

Professor J. C. DRUMMOND, scientific adviser of the Ministry of Food, addressing members of the House of Commons on May 29 on food problems in war, said the outbreak of war found a much better nourished population than was the case in 1914, owing to the increased consumption of protective foods. But with increase of prices and restrictions the lower income group might come to rely more on bread as the mainstay of its dietary. They might, therefore, be threatened by a vitamin deficiency unless a more nutritious bread came into general consumption. An educational campaign would popularize the wholemeal loaf, especially if it could be supplied at the same price as white bread. The roller mills of this country could produce a flour of 80 to 85 per cent. extraction for a thoroughly nutritious loaf without difficulty. Professor Drummond urged increased consumption of milk, cheese, and potatoes, with abundant vegetables, as a sure protection against vitamin deficiency. The Germans had made every provision to avoid the malnutrition which contributed to their defeat in 1918. They were relying on a sound peasant dietary: wholemeal bread, vegetables, potatoes, and cheese. The weak spot was a possible shortage of milk. They were issuing for the use of both troops and

civilians concentrated tablets of synthetic vitamins in every respect equal to the natural product. Such tablets were also being manufactured in this country, and the output could be increased to any extent.

Mr. BOOTHBY stated on May 29 that the whole question of the nutritive value of bread was under consideration.

Refugee Doctors

Sir ERNEST GRAHAM-LITTLE asked on May 30 for information about the Home Office Advisory Medical Committee dealing with the admission to Great Britain of foreign medical practitioners. Sir JOHN ANDERSON replied that after the invasion of Austria and Czechoslovakia the Home Office, after consultation with the medical profession, decided that fifty Austrian and fifty Czech refugee doctors might be allowed, provided they obtained a British medical qualification, to practise in this country. Of these hundred persons only four, all Austrians, had yet obtained a British medical qualification. The bona fides of all the doctors so admitted to this country was carefully tested before they were allowed to come here. Since the outbreak of war each case had been examined by one of the tribunals appointed for the purpose. The committee which advised the Home Office in the selection of these doctors included Sir Robert Hutchison (chairman), Sir Cuthbert Wallace, Sir William Willcox, Dr. G. C. Anderson, Sir William Girling Ball, Dr. P. M. d'Arcy Hart, and Professor Samson Wright.

Bombing of Hospital Ships.—On May 28 Captain PLUGGE asked the Prime Minister whether, in view of the bombing of British hospital ships, he would consider effective reprisals in some form or another against action of this kind. Mr. ATTLEE said that the bombing of hospital ships and the machine-gunning of ambulances in France might be taken, in conjunction with the deliberate attacks by German aircraft on refugees on the roads of Belgium and France, as typical of the methods of terrorism being pursued by the German Government. The Government held themselves free to take such action as they might consider appropriate, but it was not their intention to exact retribution from the wounded or from women and children.

Pay for Attendance on Air Raid Casualties.—On May 28 Mr. GROVES asked the Minister of Health whether he was aware that at its last meeting the Local Medical and Panel Committees for the county of Kent unanimously approved a resolution declaring that a sufficient domiciliary medical service could not possibly be given to persons injured in air raids for the sum of 16s. a year; and whether action would be taken to meet this point. Mr. MACDONALD replied that this resolution had not been reported to him, but in any case he saw no reason for departing from the scheme which was accepted on behalf of the profession as a whole.

Protection in Ordnance Factories.—Mr. HERBERT MORRISON assured the House of Commons on May 29 that appropriate local arrangements for medical services had been made at all Royal Ordnance Factories. Everything possible was done to prevent exposure to fumes and harmful materials. Adequate ventilation was provided, and fume and dust absorption systems installed where required. Adequate first-aid treatment was available should any case of accidental exposure occur. Workmen employed in processes involving harmful substances were issued with a complete change of clothing, which was washed once a week, protective rubber gloves, and goggles and fume masks. Extensive washing facilities, including baths and showers, were provided.

Superannuation Benefit and War Service.—The Superannuation Schemes (War Service) Bill, introduced by the Government in the House of Commons on May 29, is drafted to enable provision to be made for preventing loss of benefit under superannuation schemes by persons undertaking service with the Forces or employment for war purposes. Persons covered include those serving in any superannuable capacity within the meaning of the Local Government Staffs (War Service) Act, 1939, and persons to whom the Act has effect by virtue of the King Edward VII Welsh National Memorial Association Act, 1940.

Notes in Brief

Sir JOHN ANDERSON stated on May 30 that in the measures taken for the internment of enemy aliens no differentiation had been made in favour of students or persons working in universities.

No. 20

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended May 18, 1940.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (*a*) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1940					1939 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	334	28	77	—	12	30	4	12	1	—
Deaths		2	5				—	1		
Diphtheria	676	26	251	42	35	790	84	203	27	15
Deaths	15	—	5	—	5	25	5	8	2	—
Dysentery	38	8	33		—	39	7	24		—
Deaths			—	—	—			1	—	
Encephalitis lethargica, acute	5	—	2		—	7	—	—		—
Deaths		—	3				—	1		
Enteric (typhoid and paratyphoid) fever	46	2	10	10	1	20	—	9	8	1
Deaths	1	—	—	—	—	1	—	1	—	—
Erysipelas		1	52	2	4		35	61	5	2
Deaths			—				1	—		
Infective enteritis or diarrhoea under 2 years	29	6	4	8	8	34	7	5	7	5
Deaths										
Measles*	6,549	24	727		99		54	180		8
Deaths	5	—	3	—	3	2	—	—	3	1
Ophthalmia neonatorum	83	8	37		—	114	10	38		—
Deaths										
Pneumonia, influenzal†	719	17	11	4	4	850	86	10	2	16
Deaths (from influenza)	25	3	3	—	2	31	5	—	1	2
Pneumonia, primary		30	284	16			86	190	11	
Deaths‡				11	12		12		4	5
Polio-encephalitis, acute	1	—				—	—			
Deaths (including poliomyelitis)		1					—			
Poliomyelitis, acute	3	—	1	1	1	4	1	—		—
Deaths		—	—				—	1		
Puerperal fever		7	12	1	—	3	3	16	1	—
Deaths		1					1			
Puerperal pyrexia	160	11	20		—	179	20	22		—
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	875	32	157	38	50	1,784	167	234	50	94
Deaths	—	—	—	—	—	3	—	1	1	—
Small-pox	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough*	508	3	48		13		322	264		25
Deaths	2	—	—	1	4	22	2	4	—	—
Deaths (0-1 year)	342	47	66	20	28	316	51	59	19	16
Infant mortality rate (per 1,000 live births)						49	50			
Deaths (excluding still-births)	4,476	731	674	183	166	4,350	810	608	169	144
Annual death rate (per 1,000 persons living)			12.8	12.2	14.6	10.7	10.4	12.3	11.4	12.6
Live births	6,983	1,168	957	312	264	6,485	1,069	1,067	302	275
Annual rate per 1,000 persons living			19.4	20.8	23.2	15.9	13.7	21.6	20.3	24.2
Stillbirths	242	35	41			255	44	56		
Rate per 1,000 total births (including stillborn)			41			39	34	50		

* Made notifiable generally on November 1, 1939.

† Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

‡ Since January 1, 1940, figures for London (b) have been for deaths from all forms of pneumonia; the corresponding figures for 1939 relate to deaths from lobar pneumonia only.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

The incidence of measles and of enteric fever has increased notably in England and Wales, while cerebrospinal fever, diphtheria, scarlet fever, and puerperal pyrexia have increased slightly. The notifications of pneumonia (primary and influenzal forms) and whooping-cough have fallen considerably.

Cerebrospinal Fever

The recurrence of cerebrospinal fever is the second since the epidemic reached its peak in the week ended March 2; in magnitude it is less than one-half that recorded in the week ended March 30. Despite the increase in the total number of notifications only forty-five administrative areas were affected, compared with forty-six in the previous week and forty-nine a fortnight before. More than 10 cases were notified in the following areas: Chester 13 (Birkenhead 5, Wallasey 3, Chester C.B. 2, Lymm U.D. 1, Hoole U.D. 1, Runcorn R.D. 1); Lancaster 42 (Blackburn 2, Bootle 1, Bury 1, Liverpool 18, Manchester 5, St. Helens 1, Ashton-under-Lyne M.B. 1, Chorley M.B. 1, Lancaster M.B. 1, Little Lever U.D. 1, Radcliffe M.B. 1, Rishton U.D. 1, Swinton and Pendlebury M.B. 1, Urmston U.D. 3, Widnes M.B. 1); London 28 (Bermondsey 2, Bethnal Green 3, Deptford 1, Finsbury 1, Fulham 1, Hackney 3, Hammersmith 2, Kensington 2, Lambeth 2, Lewisham 1, Poplar 2, St. Marylebone 1, St. Pancras 1, Stepney 2, Wandsworth 2, Westminster and Woolwich 1 each); Middlesex 12 (Finchley M.B. 2, Friern Barnet U.D. 1, Harrow U.D. 1, Heston and Isleworth M.B. 2, Hornsey M.B. 3, Tottenham M.B. 2, Wembley M.B. 1); Southampton 16 (Bournemouth 1, Southampton C.B. 2, Aldershot M.B. 3, Gosport M.B. 3, Alton R.D. 2, 1 each in Havant and Waterloo U.D., in M.B.s of Lymington and Winchester, and in R.D.s of Andover and Hartley Wintney); Stafford 11 (Stoke-on-Trent 3, West Bromwich 4, Aldridge U.D. 1, Stafford M.B. 1, Lichfield U.D. 2); Surrey 12 (Croydon 1, Woking U.D. 2, and 1 each in the boroughs and urban districts of Carshalton, Coulsdon and Purley, Epsom and Ewell, Farnham, Malden and Coombe, Richmond, Sutton and Cheam, Walton and Weybridge, and Guildford R.D.); Warwick 14 (Birmingham 13, Rugby 1); Yorks, West Riding, 20 (Bradford, Dewsbury, Doncaster, Halifax, and York 1 each, Leeds and Sheffield 4 each, Conisbrough U.D. 2, and 1 each in the urban districts of Heckmondwike, Mirfield, and Otley, and in the rural districts of Hemsworth and Selby); Glamorgan 22 (Cardiff and Swansea 4 each, Merthyr Tydfil C.B. 1, 3 each in Port Talbot M.B. and Rhondda, 2 in Barry M.B., and 1 each in the urban districts of Llwchwr and Neath, and in the rural districts of Neath, Penybont, and Pontardawe).

The details of the notifications suggest that the disease is widely spread in the counties chiefly involved, and probably affects rural areas as much as populous districts in proportion to the population. In some parts the high incidence is largely due to the presence of troops, but fairly rapid spread from Service personnel to civilians and vice versa has been the usual experience. In Scotland, while there was one case fewer than last week, no fewer than thirty-four administrative areas were affected compared with twenty-six last week, out of the total of fifty-five counties and burghs in the whole country. More than two cases were recorded in the following: Glasgow 16, Edinburgh 11, and 3 each in Aberdeen (C. and B.), Ayr, Kirkcaldy, and the burgh of Motherwell and Wishaw.

Enteric Fever

The 46 cases were scattered over seventeen administrative areas, in only four of which were more than 3 cases notified—namely, Durham 7 (Gateshead 3, Sunderland 1, Boldon U.D. 1, Whickham U.D. 2); Northumberland 7 (Ashington U.D. 5, Newbiggin-by-Sea U.D. 2); Cambridge 6 (all in Cambridge itself); Lancaster 5 (Bootle 2, Liverpool 2, Salford 1).

Measles

Among the four counties chiefly affected two—Lancaster 1,661 (1,735) and Leicester 431 (449)—have recorded decreases, and two—Yorks, West Riding 911 (803), and Durham 467 (335)—increases during the week. (Figures in parentheses refer to the previous week.) So prevalent has the disease become that only one county in England (Rutland) and one in Wales (Brecknock) have escaped. In addition to the four counties mentioned as being epidemic centres, the disease is prevalent in Chester 254, Notts 258, Gloucester 232, Glamorgan 198, Northumberland 157, Sussex East 154, Lincoln (parts of Lindsey) 150, Monmouth 132, Bucks 131, Oxford 113. Notifications in the four largest cities were: Manchester 135, Liverpool 69, London 24, Birmingham 11. In Scotland only 11 areas (counties and burghs) were involved, notably Glasgow 483, Lanark county 91, Edinburgh 34, Greenock 34, Rutherglen (in Lanarkshire) 25, Paisley 18, Kirkcaldy 15. In Belfast notifications fell from 118 to 95, the remaining 4 being in Lisburn (one of the few other areas in which measles is compulsorily notifiable).

Medical News

Dr. E. H. Cluver, Secretary for Public Health and Chief Health Officer for the Union of South Africa, has been appointed Director of the South African Institute for Medical Research in succession to the late Sir Spencer Lister. The *South African Medical Journal* states that Dr. Cluver will take up his new post on July 1, when Dr. J. H. Harvey Pirie, the present acting director, retires. Dr. George Buchanan, superintendent of the routine division of the Institute, has been appointed deputy director.

The annual malaria control course for laymen (engineers, planters, etc.) will be held at the Ross Institute of Tropical Hygiene, Keppel Street, Gower Street, W.C., from June 24 to 28, at 10 a.m. daily. The course is free, and applications to attend should be sent in as early as possible to the organizing secretary at the above address.

The summer dinner of the Oxford Graduates Medical Club, arranged for June 28 at Magdalen College, has been cancelled.

In view of recent developments in the course of the war the sessional meeting of the Royal Sanitary Institute which was to have been held at Aberystwyth on June 29 has been indefinitely postponed.

The B.B.C. announces that in the series of talks "I Knew a Man," on Saturday, June 22, at 6.45 p.m., Sir StClair Thomson, M.D., F.R.C.S., will speak on Lord Lister.

The Ministry of Health and the Department of Health for Scotland again remind hospitals, private individuals, and industrial concerns that it is contrary to the national interest for them to hoard oxygen and nitrous oxide cylinders, whether filled or empty. There now appears to be a renewed tendency to hold undue supplies. The adequacy of the existing supplies can only be assured if cylinders are not held in excess of actual requirements and if they are kept in constant circulation. Empty cylinders should be returned with the minimum of delay to the suppliers by whom they were issued.

Dr. H. M. C. Macaulay, deputy county medical officer of health since 1925, has been promoted to the post of medical officer of health under the Middlesex County Council in succession to the late Dr. J. Tate.

A school of psychotherapy has been founded in Zurich in which the phenomena of psychoneurosis will be taught by means of lectures and practical demonstrations.

Dr. Louis Babonneix, the well-known Paris paediatrician, has been elected a member of the Académie de Médecine in place of the late Professor Marcel Labbé.

Dr. Thomas Parran, surgeon-general of the United States Public Health Service, has been nominated for reappointment by President Roosevelt.

There has recently been a considerable increase of trachoma in Lithuania.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

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ADVERTISEMENTS.—All communications should be addressed to the Advertisement Manager (office hours, 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and communications with reference to subscriptions should be addressed to the Secretary, B.M.A. House.

The TELEPHONE NUMBER of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

The TELEGRAPHIC ADDRESSES are
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QUERIES AND ANSWERS

First-aid Treatment of Epistaxis

"J. J." writes: Can anyone say why the first-aid book advises that a patient whose nose is bleeding should raise his arms high above his head? Common sense tells that a bleeding point should be put as high as possible, and to raise the arms above the head must necessarily increase the hydrostatic pressure in the nose. Is there some special reason for the advice?

Income Tax

Resident Abroad coming to England

"F. K." inquires whether a non-resident medical man returning to this country "to do medical work, civil or military, in view of the present emergency" would be entitled to the allowances, etc., applicable to residents here, and whether he would be liable to taxation on his foreign income and 3½ per cent. War Loan dividends.

*** If he takes up work in one of the Forces of the Crown he will be given the usual allowances and will not be taxed on income exempt in the hands of a non-resident. But this concession does not apply to civilian work, even though of national importance.

Military Service

"W. S." was up to September engaged in civil practice and was a captain in the R.A.M.C. He was called up before war was declared. He is assessed for 1939–40 on the amount of his civil earnings for the year to October, 1938, and also on his Army pay for the period September, 1939, to March, 1940.

*** "W. S." will probably find that a remedy is provided for the hardship by Section 11 of the Finance (No. 2) Act, 1939. We advise him to prepare a statement of his *civil* earnings for the year to April 5, 1940, and forward it to the inspector of taxes who deals with that income, referring him to the above section and asking him to arrange for any relief due for the year 1939–40. (We assume that the civil practice has been put into commission or otherwise kept in being, and has not "ceased.")

Two Practices or One?

"A. H." bought a practice two miles from his residence, where he also started practice. The inspector of taxes requires separate returns for the (?) two practices, and objects to the cash basis of reckoning receipts.

*** Whether there is one single practice or whether "A. H." has added a new practice at his residence to a different one is a question of fact—the two-mile separation would not be an insuperable bar. But in any case the result should not be substantially different. If, as he anticipates, he can prove a loss at the residence he can claim to set it off under "Rule 13, applicable to Cases I and II Schedule D"—in fact this might suit him better, as it would operate more quickly. This practice should be claimed as starting when the plate was put up—cite decision in Kirk *v.* Randall. The "bookings" basis must be accepted for the first three years of a new practice. An interview with the inspector would probably assist in a settlement.

LETTERS, NOTES, ETC.

Mass Radiography

Dr. L. BANSZKY (London, W.) writes: It may be of some interest to Drs. F. J. Bentley and Z. A. Leitner that many of their suggestions for the prevention of pulmonary tuberculosis among industrial employees (June 1, p. 879) have already been in operation in some factories in this country since 1934. They say: "Investigations might also be conducted on an occupational basis by examining all employees in particular factories or other commercial organizations, and some large employers of labour might find it well worth while to undertake screen photography of all new workers." In a factory near London (Mitcham Works, Mitcham Junction, Surrey) employing about 4,000 workers, every employee, whether clerical or labourer, is examined medically and by fluoroscopy before being accepted, and is placed into different departments according to the findings of the medical examination. All employees are rescreened at an interval of not more than one and a half to two years. In case of any suspicion of pulmonary tuberculosis found on screening, thorough radiographic examination of the chest, with sedimentation test, blood counts, and sputum test, is carried out in every case on the premises, and when the activity of the lung process is established beyond doubt the case is referred to the patient's own doctor with the diagnosis. Doubtful cases are kept under observation, during which time the employee is given work in suitable surroundings. All tests are repeated monthly. By this method it was possible to reduce the percentage of pulmonary tuberculosis from a yearly average of 0.83 to 0.88 found among applicants for work to 0.24 found among previously screened old employees. Altogether over 10,000 workers have been screened since 1934. I communicated these results to the National Association for the Prevention of Tuberculosis in Belfast, 1939 (see *Transactions* of the twenty-fifth Annual Conference of the N.A.P.T.), together with suggestions for the prevention of tuberculosis among the civilian population—similar to those mentioned in the paper on mass radiography.

Schäfer versus Sylvester

"X. Y." writes: Some years ago I, with difficulty, managed to bring a man, unconscious, from the bottom of the sea to the rocky shore. I, being an anaesthetist, was well versed in Sylvester's method of artificial respiration, as anaesthetists were in those days, and no doubt still are. I proceeded to apply it successfully. When the patient breathed I sat back, tired and fed up, and feeling I hadn't done so badly. Two first-aid men who had watched the proceedings with not altogether silent contempt (my rescue had also violated all the canons of the first-aid manual) promptly seized him, turned him over, and proceeded to do a vigorous Schäfer on him. The patient's bruised ribs were not more sore than my vanity, which had led me to expect some credit from the matter, but apparently the real rescue began when he left my hands.

The Naming of Scientific Instruments

The rapid development of scientific instruments in recent years has caused a good deal of confusion in the nomenclature. Often, owing to unfortunate nomenclature, it is not even realized that an instrument for some special purpose is actually in production; the trade name in such cases gives no clue to the purpose of the instrument. Much effort might be saved if the nomenclature of scientific instruments were put on a sound basis. A suggestion that there should be set up an authoritative body to whom the proposed name for an instrument could be submitted for approval is one of several contained in an article by Mr. J. W. Williamson (formerly secretary of the British Scientific Instrument Research Association) in the May issue of the *Journal of Scientific Instruments*, published by the Institute of Physics at the University, Reading, price 2s. 8d., post free.

Corrigendum

Mr. R. P. G. SANDON (Secretary of the Men's Common Room, King's College Hospital Medical School) writes: An item under the heading Medical News in your issue of May 18 appears to suggest that this hospital is associated with the United Hospitals Socialist Society. I am directed to inform you that the few King's students present at the meeting were there as casual visitors, and neither purported to be nor were in any way representatives of their fellows. The King's student elected to the committee has since resigned.